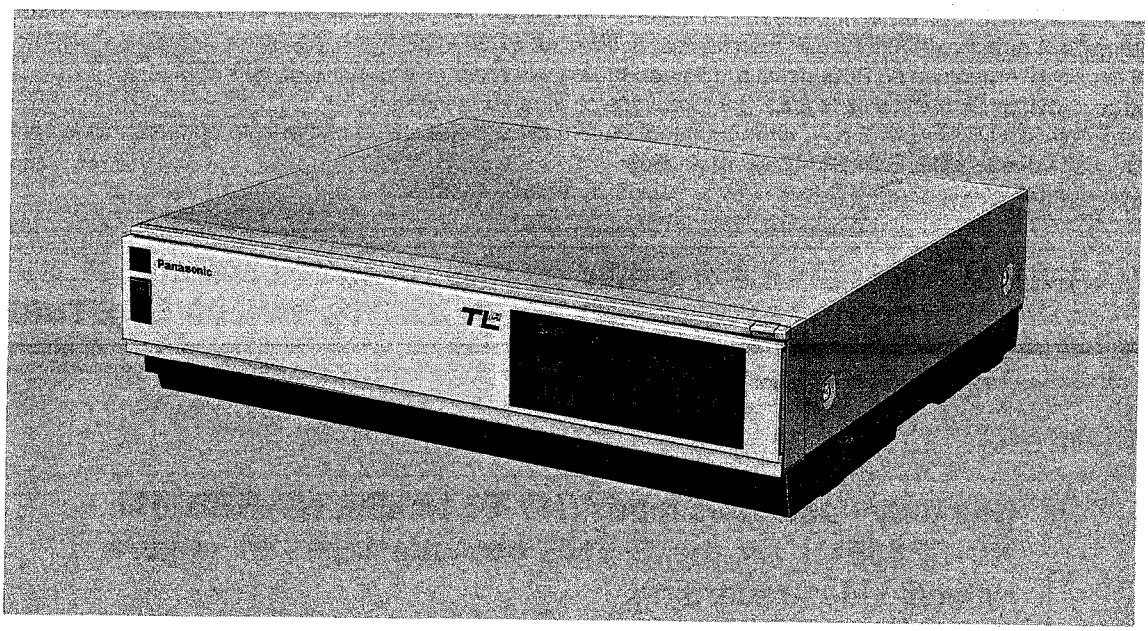
Operating Instructions

S-VHS 625 VHS PAL

Time Lapse Recorder

Model AG-6720 -A -B -E



Panasonic

Before attempting to connect, operate or adjust this product, please read these instructions completely.

For Your Safety

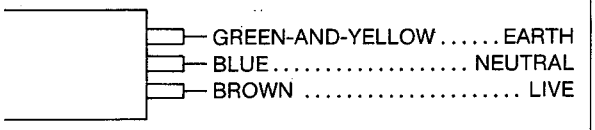
■ **THIS APPARATUS MUST BE EARTHED.**
To ensure safe operation the three-core lead supplied (not for U.K. model) must be connected only into a standard three-pin power point which is effectively earthed through the normal household wiring.
Extension cords used with the equipment must be three-core and be correctly wired to provide connection to earth. Wrongly wired extension cords are a major cause of fatalities.
The fact that the equipment operates satisfactorily does not imply that the power point is earthed and that the installation is completely safe. For your safety, if in any doubt about the effective earthing of the power point, consult a qualified electrician.

■ **DO NOT REMOVE PANEL COVER BY UNSCREWING**
To reduce the risk of electric shock, do not remove cover. No user serviceable parts inside. And do not insert fingers or any other objects into the video cassette holder.

CAUTION:
TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

■ **AC POWER CORD CONNECTION (AG-6720-B only)**
The wires in the mains lead for this apparatus are coloured in accordance with the following code.

Important



Mains Lead

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:
The wire which is coloured GREEN-AND-YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol ⏚ or coloured GREEN or GREEN-AND-YELLOW.
The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured black. The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured red.

Remark:
This apparatus was produced to BS 800.
Dieses Modell entspricht der EG-Vorschrift (für Funkstörungsschutz) 87/308/EWG.
La Société PANASONIC-FRANCE, importateur du matériel MATSUSHITA-JAPON déclare que cet appareil est conforme aux prescriptions de la directive 76/889/C.E.E. modifiée par la directive 87/308/C.E.E.
Dit model is onderworpen aan de EEG-richtlijn (ter voorkoming van radio-interferentie) 87/308/EEG.
Denne model opfylder EF direktiv 87/308/EF (for forebyggelse af radiointeferens).
La Società PANASONIC ITALIA S.p.A., importatrice di questo prodotto, dichiara che questo apparecchio è conforme alle disposizioni della direttiva C.E.E./87/308 (D.M. 13. 4. 1989).
Este modelo cumple con la norma EC (para interferencias de radio 87/308/EEC).

WARNING: TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

▒▒ is the safety information.

Use only Panasonic tapes (NV-SE180EM, NV-SE60EM, NV-SE30EM) for the S-VHS cassette tapes to ensure reliable video recording.

Inspection

Standard Accessory

•S-VIDEO Cable (4P) (1.5 m) 1 pc.

Optional Accessories

•Mini-CCTV System

•Sequential Switcher

•Cassette Tape

VHS tape

NV-E240 NV-E90
NV-E180 NV-E60
NV-E120 NV-E30

S-VHS tape

NV-SE180EM
NV-SE60EM
NV-SE30EM

- Do not insert fingers or any other objects into the video cassette compartment.
- Avoid operating or leaving the unit near strong magnetic fields. Be especially careful of large audio speakers.
- Avoid operating or storing the unit in an excessively hot, cold, or damp environment as this may result in damage both to the recorder and to the tape.
- This unit is supplied with a 3-prong grounded AC plug—do not try to defeat its purpose.
- Do not spray any cleaner or wax directly on the unit.
- If the unit is not going to be used for a length of time, protect it from dirt and dust.
- Do not leave a cassette in the recorder when not in use.
- Do not block the ventilation slots on the top of the unit.
- Use this unit horizontally and do not place anything on the top panel.
- Cassette tape can be used only for one-side, one direction recording. Two-way or two-track recordings cannot be made.
- Cassette tape can be used for either Colour Black & White recording.
- Do not attempt to disassemble the recorder. There are no user serviceable parts inside.
- If any liquid spills inside the recorder, have the recorder examined for possible damage.
- Refer any needed servicing to authorized service personnel.

WARNING: UNAUTHORIZED RECORDING OF COPYRIGHTED TELEVISION PROGRAMMES, FILMS, VIDEO TAPES AND OTHER MATERIALS MAY INFRINGE OF THE RIGHTS OF COPYRIGHT OWNERS AND BE CONTRARY TO COPYRIGHT LAWS.

Table of Contents

Features 4
AG-6720 VTR Monitoring/Checking System 5
Controls and their Functions 6
The Monitor Screen Settings 13
Display Page Functions 14
Data and Time Settings 16
Time Mode Settings 20
Normal Picture Settings 22
• **Selection of Normal Picture Display** 22
• **Menu Page Block Display Setting** 23
VTR Mode Selection After the Tape End Detection 24
Verifying the Data entered in the Memory 25
Recording 26
Better Recording 27
Automatic Recording 29
Timer Recording 30
• **Internal Timer Recording** 30
• **Daily Timer Recording** 32
• **Weekly Timer Recording** 34
• **External Timer Recording** 36
1-Shot Recording 37
Auto Repeat Recording 39
Auto Rewind Function After Recording 40
Sensor Recording 41
Alarm Recording 42
• **Alarm recording mode settings** 44
Sequential Switcher Connected Recording 46
Playback 48
Better Playback 49
Playback in Various Ways 50
• **Alarm Search Playback** 51
• **Continuous search forward/rewind playback** 51
Moist Indicator 52
Daily Maintenance 53
Troubleshooting 54
Possible recording time in 1-shot recording 56
Specification 57

Features

1. Horizontal resolution of 400 lines with S-VHS system

The unit's adoption of the S-VHS system yields a horizontal resolution of 400 lines in both the colour and black-and-white modes.

2. 2-reel IQ (Intelligent Quest) mechanism

The IQ mechanism employing two reel motors turns this unit into a time lapse video system which provides the ultimate in reliability. In fact, the unit features a design which stresses high reliability throughout and this is evident in the unit's stable tape transport, front loading mechanism, DD cylinder and capstan motors.

3. "Double fine slow-motion" recording and playback

The unit incorporates a "double fine slow-motion" system that enables intermittent field recording and playback.

By introducing a new microprocessor into the servo circuit, pictures with much less skew than in conventional machines can be viewed when a tape which has been recorded in one of the 14- to 480-hour time lapse modes is played back in the 3-hour mode.

Another highlight is that the images are defined in much greater detail with the intermittent field recording system than with the intermittent frame recording system.

4. Complete range of time lapse modes

Besides the SP (3-hour) mode in VHS and S-VHS in which audio signals can be recorded, the intermittent recording (for 14-, 24-, 48-, 72-, 120-, 180-, 240-, 480-hour or 1-shot modes) is also featured.

5. Mode programming using monitor screen

All the various function mode settings, including the recording times of the internal timer, the alarm recording mode and the sensor recording mode, can be programmed on the monitor screen.

6. Retention of modes using non-volatile memory

Built-in timer recording times, recording time modes, alarm recording modes, sensor recording modes and other important data can be retained in the memory semi-permanently.

7. Full spectrum of recording functions

The array of recording functions extends from power failure recording, recording using an external timer, to daily and weekly recording using the internal timer, sensor recording and alarm recording.

8. Built-in time/date generator

This unit comes with a generator and micro-processor featuring a calendar function which enables the user to indicate times on the displays, display times on the monitoring screen and control the times of the internal timer.

9. Large-size display

In the interest of easy readout, a large-size display is used for the time and tape counter indications as well as for the various displays in the tape transport modes and recording modes.

10. Approx. 1-month timer back-up

Even if the power fails, the internal battery provides back-up lasting approximately 1 month for the timer.

11. Retention of mode prior to power failure

The internal battery provides back-up lasting about 1 month for the various operating modes.

12. Double mode lock function

In order to safeguard against any errors that might be made in operation during recording, a double mode lock function is provided. (Mode 1 locks out all buttons during recording, while mode 2 locks out all but the Eject Button. However, in both modes Page and Rec Review operations are still available.)

13. Forward/reverse field advance function

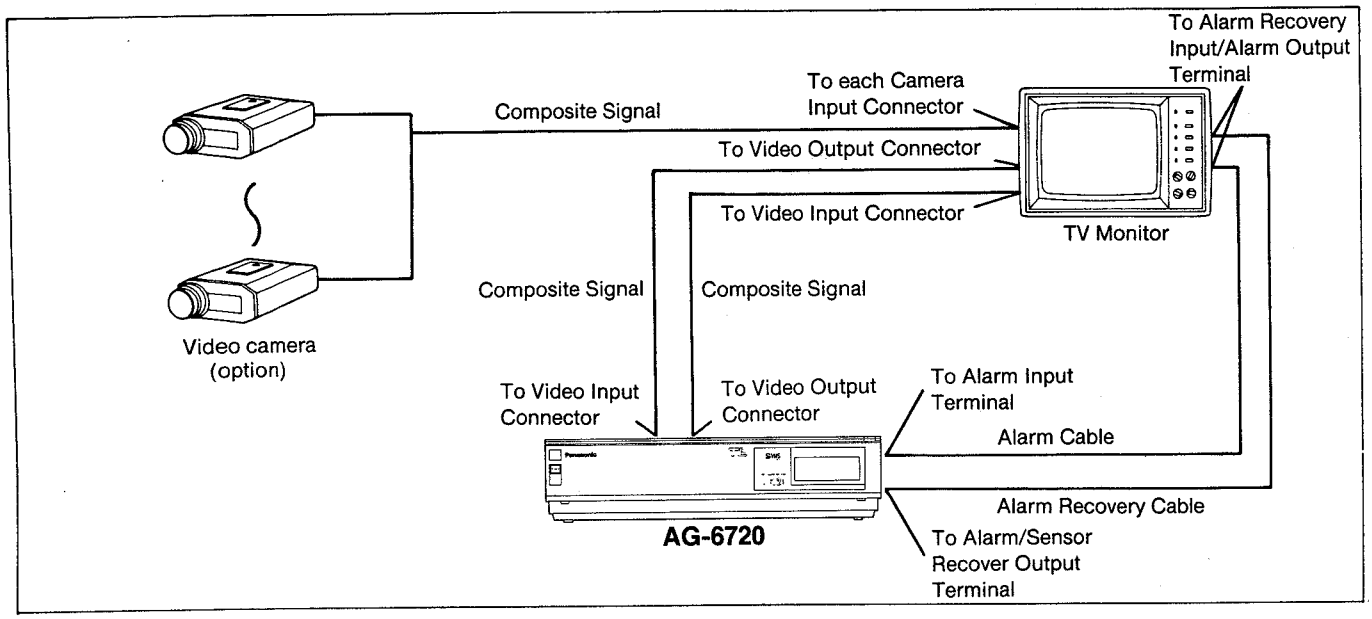
This unit has two reel motors to enable field-by-field tape play in both forward and reverse directions.

14. REC REVIEW function

When recording in any of the 14- to 480-hour time lapse or 1-shot modes, the quality of the video material just recorded can be checked simply by pressing a button.

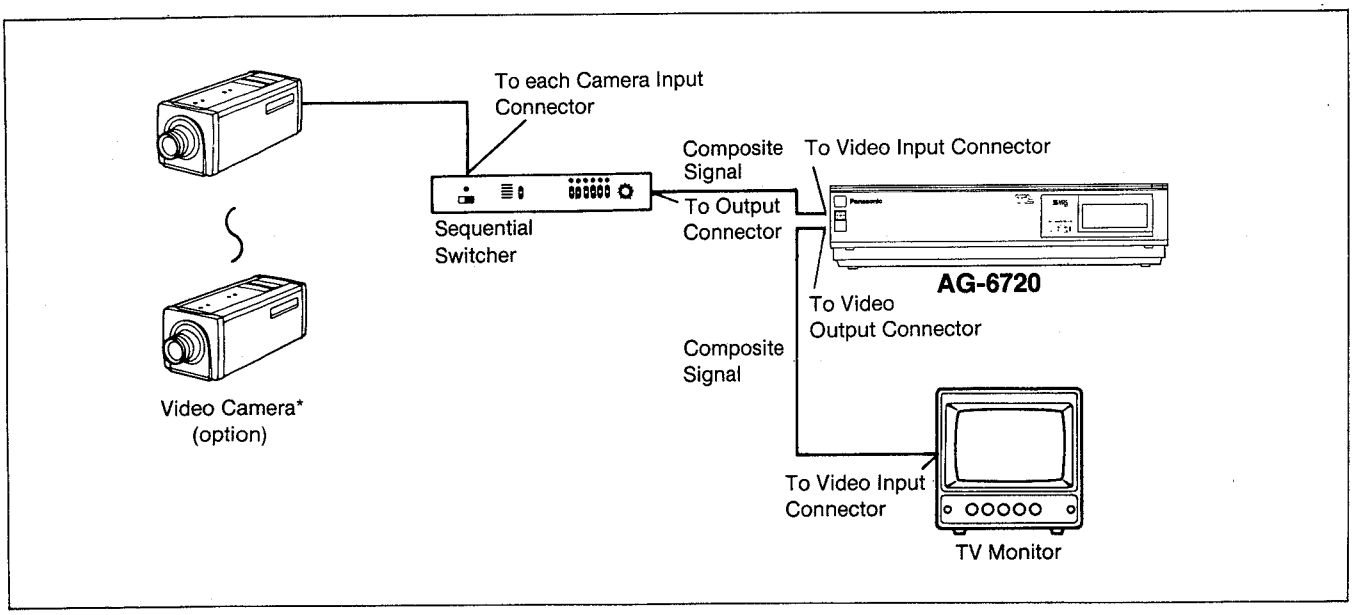
AG-6720 VTR Monitoring/Checking System

• Using a Mini-CCTV System (Composite System)



•Mini-CCTV system (option) is a monitoring TV camera system with a sensor input terminal that can be interlocked with an Alarm Switch and Intercom.
The system incorporates a Sequential Switcher capable of automatic switching at 1 sec. to 60 sec. intervals as well as fixed monitoring. The Mini-CCTV System requires no power supply wiring for the cameras.
For details, refer to the operating Instructions of the Mini-CCTV.

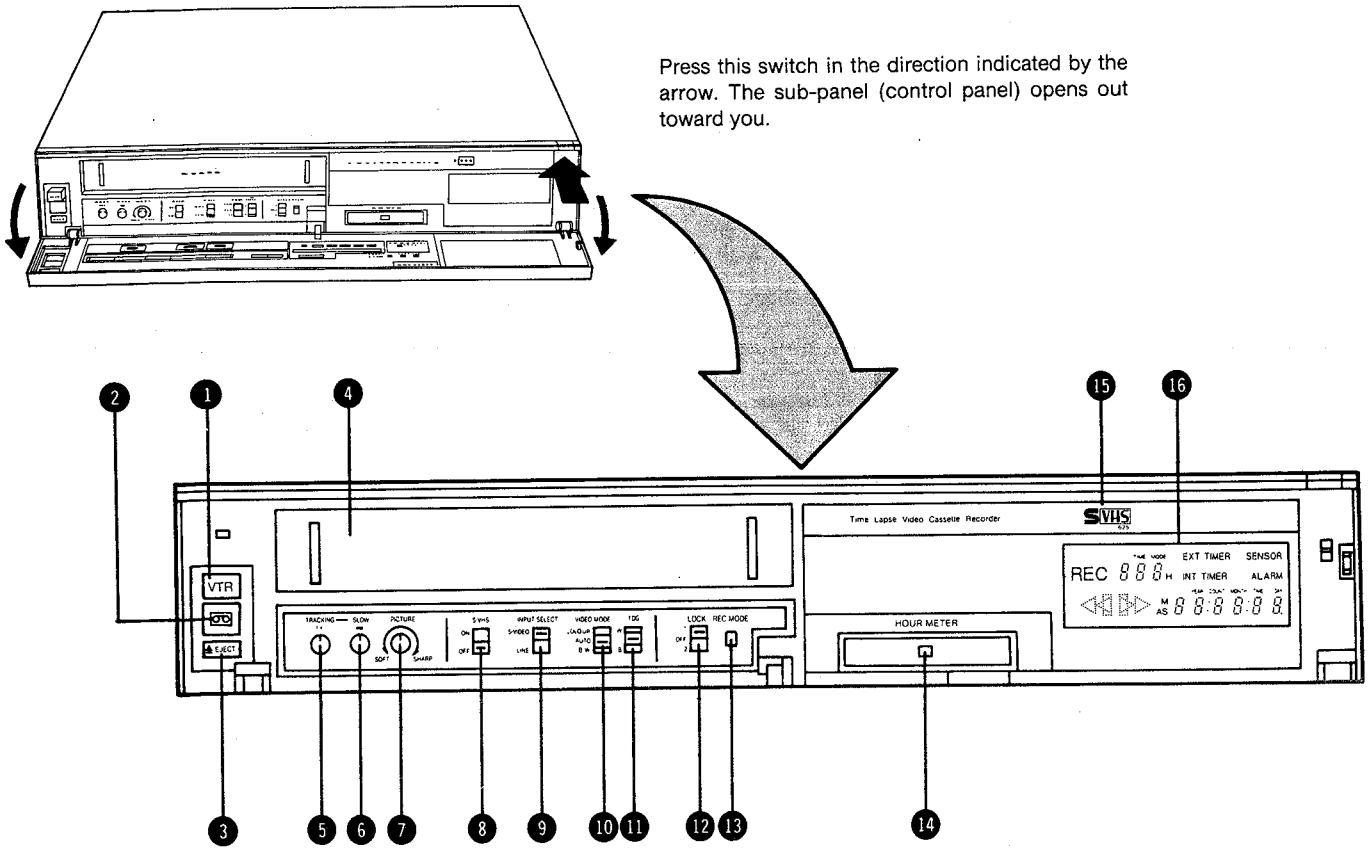
• Using the Sequential Switcher (Composite System)



* The use of a video camera with genlock capabilities is recommended when setting up a system with a sequential switcher.

Do not supply the signals of a colour camera and black-and-white camera to the camera input connector at the same time since the monitor screen may be affected by sync disturbances or noise generation.

Controls and their Functions



Front Panel

1 VTR Switch/Lamp [VTR]
Press once to turn power on, and a second time to turn power off.

2 Tape Indicator
Lights when a video cassette is loaded.

3 Eject Button [EJECT]
Press to eject a video cassette.

4 Cassette Holder
Insert a video cassette here.

5 Tracking Control [TRACKING]
Use this control to adjust tracking should noise appear as lines in a portion of the video image during playback in the 3-hour mode. Normally, it can be left in the click detent position (where it stops naturally when turned gently).

6 Slow Tracking Control [SLOW]
Use this control to adjust tracking should noise appear as lines in a portion of the video image during playback in the 14~480 hour mode or during slow reverse playback operations such as field advance. Normally, it can be left in the click detent position (where it stops naturally when turned gently).

7 Picture Control [PICTURE]
Use to adjust the sharpness of the picture during playback.

8 S-VHS Recording Mode ON/OFF Switch
ON: The unit distinguishes between VHS and S-VHS tape and switches to the appropriate recording or mode automatically.
OFF: Recording take place in the VHS mode with both VHS and S-VHS tape.
The unit distinguishes between VHS and S-VHS, and switches to the appropriate playback mode automatically.

⑨ Input Signal Selector Switch [INPUT SELECT]

S-VIDEO: The video signal from the machine connected to the 4-pin S-VIDEO IN Connector is recorded. Selects the S-VIDEO input.

LINE: The video signal from the machine connected to the VIDEO IN Connector is recorded. Selects the VIDEO input.

⑩ Video Signal Mode Selector Switch [VIDEO MODE]

Use during recording or playback if the video signal is unstable, etc.

COLOUR: Selects the colour video signal mode.

AUTO: The unit automatically detects the type of the video input or playback signal and switches to the colour or balck-and-white video signal mode, as appropriate.

B/W: Selects the black-and-white video signal mode.

⑪ Time Date Generator Character Display Selector Switch [TDG]

W: Displays white characters.

B: Displays black characters.

⑫ Recording Mode Lock Switch [LOCK]

Use to prevent accidental switching to another mode during recording.

1: No buttons except for the Record Review Button and the Page Button operate during recording.

OFF: All buttons operate normally.

2: No buttons except for the Eject Button, the Record Review Button and the Page Button operate during recording.

⑬ Recording Mode Selector Button [REC MODE]

Press this button to switch between the following three recording modes in the order indicated. The selected mode appears in the upper right-hand corner of the display.

EXT TIMER: When the external timer recording mode is selected, "EXT TIMER" appears on the display. The external timer recordings begin automatically when the main power is recovered.

INT TIMER: When the internal timer recording mode is selected, "INT TIMER" appears on the display. Recording takes place automatically in the time mode set using the menu screen.

SENSOR: When the sensor recording mode is selected, "SENSOR" appears on the display. Sensor recording takes place according to the menu settings when a signal is input to the Alarm Signal Input Terminal on the rear panel.

⑭ Hour Meter Button [HOUR METER]

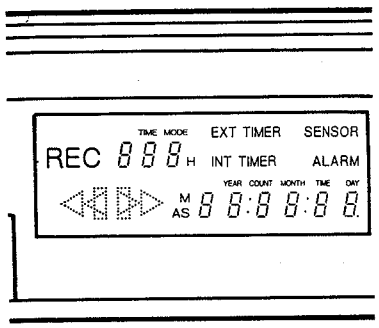
Press to display on the display timer the amount of time the unit has been in use up to a maximum of 9,999 hours (approximate value). This is useful for maintenance and inspections.

⑮ S-VHS Lamp [S-VHS]

This lamp lights up when the unit is in the following mode;

- Playing back the tape recorded in the S-VHS mode.
- The S-VHS Recording Mode ON/OFF Switch ⑧ is in the "ON" position during recording S-VHS tape or E-E mode.

⑯ Display Section



Recording Mode Indicator [REC]
Lights during recording.

Time Mode Indicator [TIME MODE H]
Displays the time mode set with the Time Mode Buttons. The unit automatically detects during playback whether the tape was recorded using the 3-hour mode and this indicator displays the mode.

External Timer Mode Indicator [EXT TIMER]
Lights when the external timer mode has been selected pressing the Recording Mode Selector Button. The external timer recordings begin automatically when the power is supplied to the unit.

Internal Timer Mode indicator [INT TIMER]
Lights when the internal timer recording mode has been selected pressing the Recording Mode Selector Button. Recording takes place automatically in the time mode set using the menu screen.

Sensor Mode Indicator [SENSOR]
Lights when the sensor recording mode has been selected pressing the Recording Mode Selector Button. Sensor recording can be performed according to the menu settings.

Alarm Mode Indicator [ALARM]
When the "alarm recording mode" is set to any position except OFF on the Menu 3, the display will light.
Alarm recording of the time mode and recording time set using the menu screen can be performed.
When "SENSOR" has been selected by pressing the Recording Mode Selector Button, the alarm mode will not be operative, sensor recording will have precedence.

Time/Counter Indicator
The display toggles between the time and tape counter indication each time the Time/Counter Selector Button is pressed, and the appropriate indicator lights.

•Error Message
Displays an error code should certain abnormalities occur during operation of the unit.
The following list is an explanation of each code.

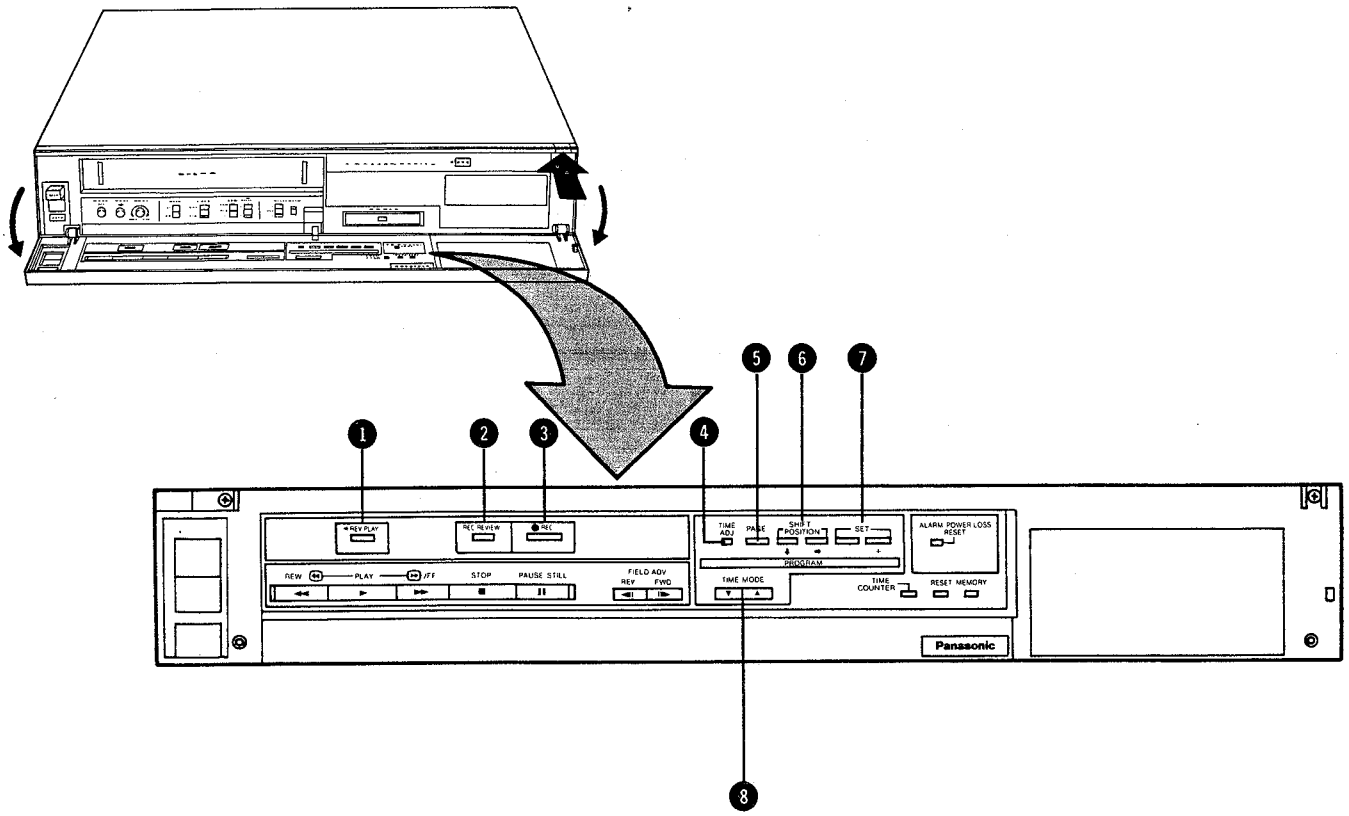
E-2: The video cassette loading motor is out of order.
E-3: The video cassette tape is not loaded properly.
E-4: Abnormal cylinder lock rotation during recording or playback.
E-5: Abnormal reel rotation during tape running.
E-6: Improper tape tension during tape running.

Alarm Search Indicator [AS]
Lights in the alarm search mode.

Memory Stop Indicator [M]
Lights in the memory stop mode.

Operation Mode Indicators
The indications shown below displays the VTR mode when the operation buttons (❶~❸, ❿~⓬, ⓮) on the Sub-Panel are pressed.

Mode	Display Indication
Playback	▷
Recording	REC ▷
Still	▯▯
Record Review	REC ▷
Fast Forward	▷▷
Rewind	◁◁
Search Forward	▷▷
Search Reverse	◁◁
Reverse Playback	◁



Sub-Panel Section

❶ Reverse Playback Button [REV PLAY]
Press this button during play to continue playback with the direction of tape travel reversed. During reverse playback the time mode indicator shows the tape speed. In the 1-shot playback mode, this button is inoperative.

❷ Record Review Button [REC REVIEW]
Pressing this button during recording in the 14~480 hour or 1-shot recording modes, run the tape backwards and replay the recorded section. The unit then switches back to the recording mode.

❸ Record Button [REC]
Press to begin recording. The display recording mode indicator lights.

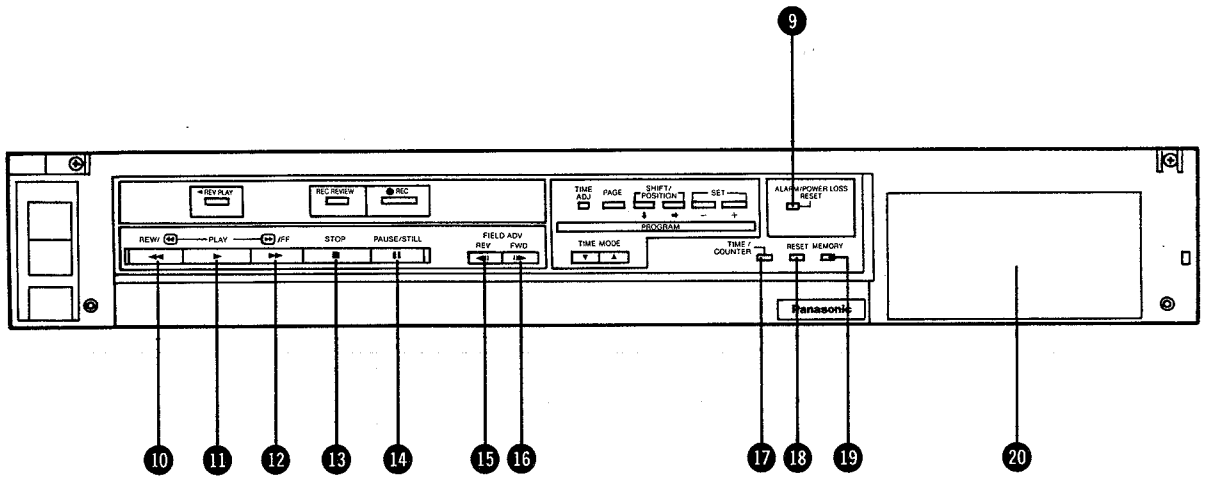
❹ Time Adjust Button [TIME ADJ]
Press this button to set the time and date on the display section. (See page 18.)

❺ Page Button [PAGE]
This button is used to page through menus. Pressing the Page Button from the Menu 5 causes the unit to revert to the normal picture. (See page 13.)

❻ Shift/Position Buttons (↓ , →) [SHIFT/POSITION]
These buttons are used to make selections from modes on the Menu Pages and to change the position of the displayed date/time, lapsed time and page count.

❼ Set Buttons (+, −) [SET]
This button is used to make selections from menus and to change time settings. (See page 16.) Press the + or − buttons as appropriate to change values or items.

❽ Time Mode Buttons (▼ , ▲) [TIME MODE]
These buttons are used to set the recording and playback time modes. Press the ▼ and ▲ buttons as appropriate to change the time mode.



9 Alarm/Power Loss Reset Button [ALARM/POWER LOSS RESET]

After moving to "MEMORY" ALARM or POWER LOSS on the Menu 5, press this button to reset the alarm recording and power loss memory to the previous memory settings. The lap time or the page value will reset respectively by pressing this button on the lapsed time display page or the page count display page.

10 Rewind Button [REW]

Press to rewind the tape. Hold this button down during play for search reverse playback.

- In the alarm search mode, search reverse playback continues even after the button is released.

11 Play Button [PLAY]

Press to begin playback.

12 Fast Forward Button [FF]

Press to wind the tape rapidly forward. Hold this button down during play for search forward playback.

- In the alarm search mode, search forward playback continues even after the button is released.

13 Stop Button [STOP]

Press to halt tape travel.

14 Pause/Still Button [PAUSE/STILL]

When this button is pressed during recording or playback, the tape pauses and a still picture is displayed. Press a second time to resume tape travel.

- If this button is pressed during recording in the 3-hour recording mode, the tape will rewind for approximately 3 seconds before pausing.When pressed a second time, the tape will advance for approximately 3 seconds before recording continues.
- The tape will pause if this button is pressed during recording in the 14~480 and 1 shot hour recording mode. Press a second time to resume tape travel.

15 Field Advance Reverse Button [FIELD ADV REV]

Press during still playback to advance the playback picture field by field in the reverse direction.

16 Field Advance Forward Button [FIELD ADV FWD]

Press during still playback to advance the playback picture field by field.

17 Time/Counter Selector Button [TIME/COUNTER]

Press this button to toggle the display between the time and counter indications.

18 Reset Button [RESET]

Press to reset the tape counter to [0:00:00].

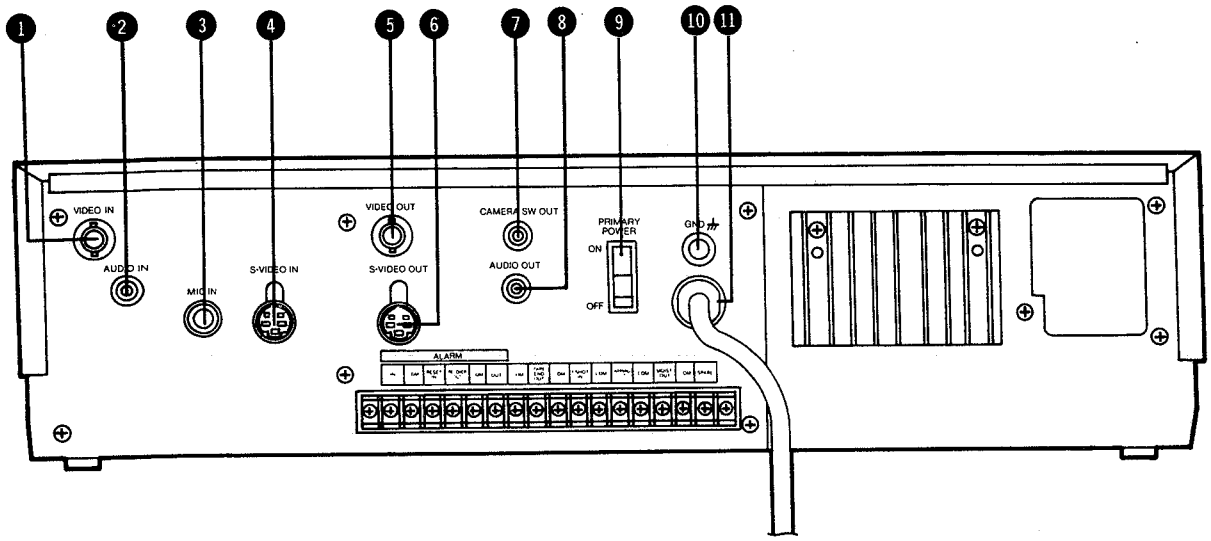
19 Memory Button [MEMORY]

Press this button to switch the display between "M", "AS" and no display.

- If "M" (memory stop) is displayed, tape travel will stop automatically when the counter reaches [0:00:00] during fast forward or rewind.
- If "AS" (alarm search) is displayed, still playback will commence from any alarm record start point encountered during fast forward or rewind.

20 Display Window

This transparent window allows the user to view the display even when the Sub-Panel is closed.



Rear Panel

1 Video Input Connector [VIDEO IN]
Connect a video camera or similar equipment to the Video Input Connector using a BNC connector.

2 Audio Input Jack [AUDIO IN]
This jack (phono jack) is for audio input.

3 Microphone Input Jack [MIC IN]
This is the 1/4" jack for connecting an external microphone (600 ohm impedance).

4 S-Video Input Connector [S-VIDEO IN]
This 4-pin connector allows input of separate luminance and chrominance signals.

5 Video Output Connector [VIDEO OUT]
This is a BNC connector for the video output signal. Connect a monitor television, video recorder, time base corrector, etc. here.

6 S-Video Output Connector [S-VIDEO OUT]
This 4-pin connector allows output of separate luminance and chrominance signals.

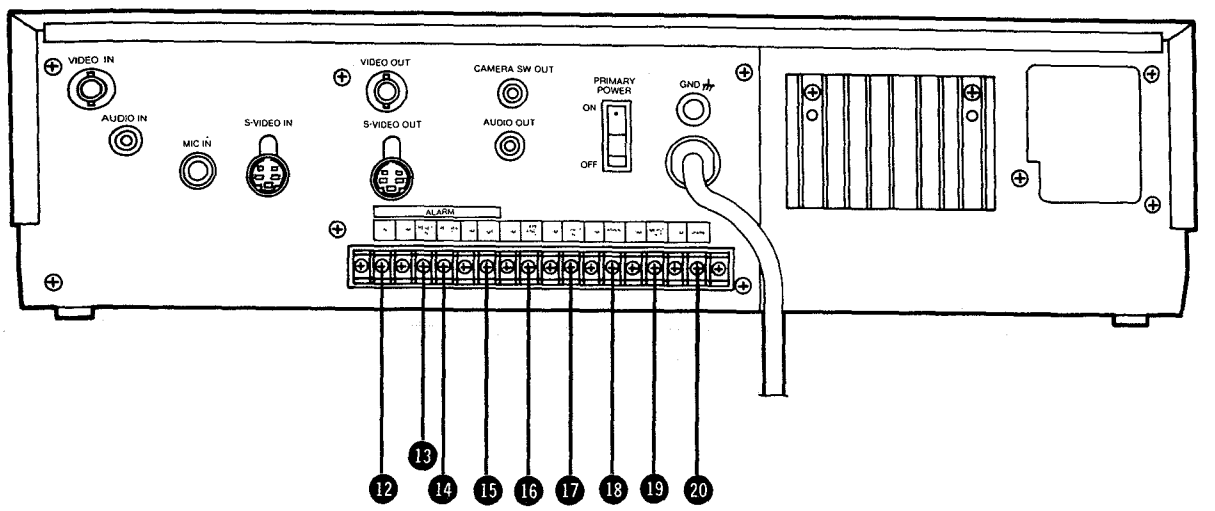
7 Camera Switching Signal Output Connector [CAMERA SW OUT]
The camera switching signal is output via this connector. Connect to a Sequential Switcher.

8 Audio Output Jack [AUDIO OUT]
This jack (phono jack) is for audio output.

9 Primary Power ON/OFF Switch [PRIMARY POWER]
Setting this switch to the "OFF" position removes all applied power from the unit.
Switching ON or OFF the unit section is performed with the front panel VTR Switch.
Set this switch to the "OFF" position when this unit is not used for a long time.

10 Ground Terminal [GND]
Connect to external ground, if audio hum or buzz is heard while monitoring or playing back.

11 AC Power Cord [AC IN]
Connect the power cord into an AC Outlet.



⑫ Alarm Input Terminal [ALARM/IN]
Connect an external sensor here. Alarm or sensor records are input via this terminal.

⑬ Alarm/Reset Input Terminal [ALARM/RESET IN]
This input terminal is used to cancel an alarm or sensor recording. A signal strength of between +3 - +15V is required.

⑭ Alarm/Recover Output Terminal [ALARM/RECOVER OUT]
A +5V signal is output during alarm or sensor recording. Connect any external equipment to which an alarm signal is to be applied.

⑮ Alarm Output Terminal [ALARM/OUT]
This is for relaying externally that an alarm or sensor recording has been generated. A +12V signal is output. Connect to an external alarm lamp or buzzer. See page 42.

⑯ Tape End Output Terminal [TAPE END OUT]
Normally, a +12V signal is output from this terminal.
- When the tape reaches its end during recording, DC 0V pulse (ground potential) is output.
- When the tape reaches its end during Auto-repeat recording, an approximately 2 sec pulse is output.

Connect to an external alarm lamp or buzzer.
(To release the output of the tape end detection signal, press the Eject Button, Stop Button, Fast Forward Button or Rewind Button on the sub-panel.)

⑰ 1-Shot Input Terminal [1SHOT IN]
This input terminal is for 1-shot recording by remote control.

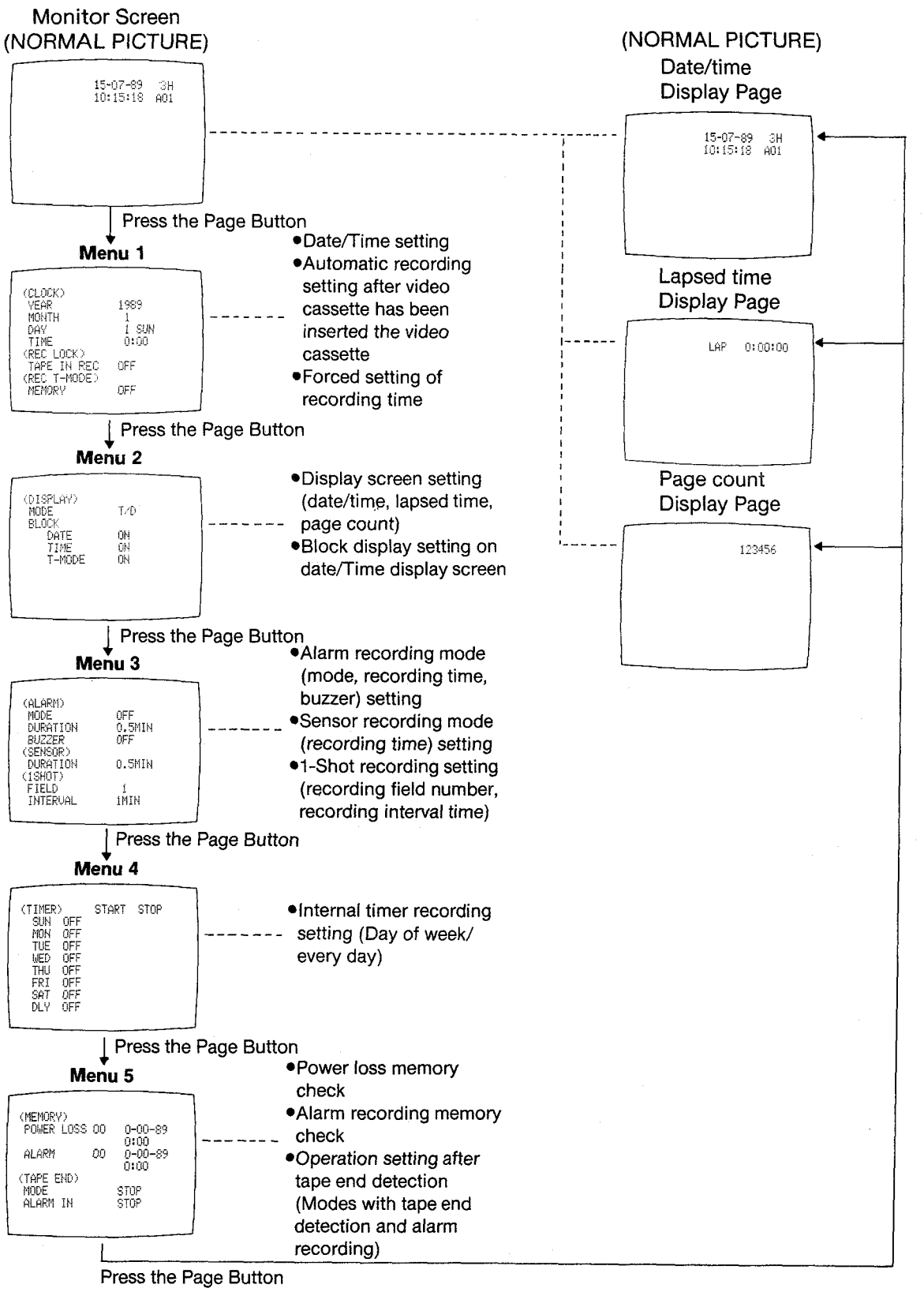
⑱ Warning Output Terminal [WARNING OUT]
This terminal is for providing warning of irregularities in the unit's operation. A +12V signal is output, when any error number from "E-2" to "E-6" appears on the time/counter indicator of the display section.
For details on messages and troubles, refer to the "⑯ Display Section" on page 8.

⑲ Moisture Sensor Output Terminal [MOIST OUT]
DC 0V pulse (ground potential) is output when moisture or condensation has formed inside the unit or on the video cassette.

⑳ Spare Terminal [SPARE]

The Monitor Screen Settings

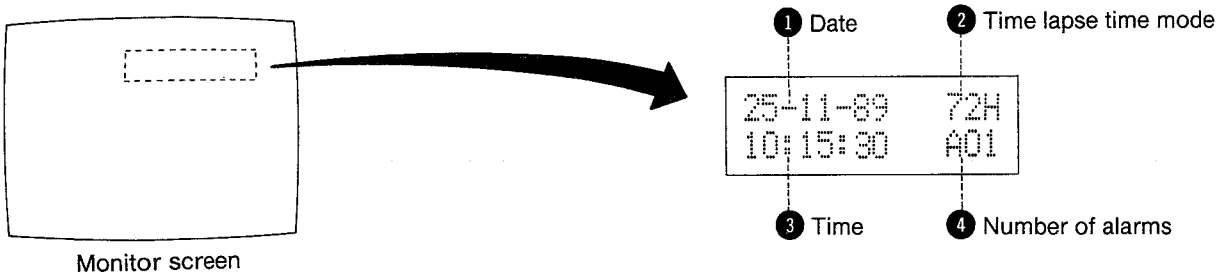
Settings for the date, time, time mode and for the menus are made on 5 menu pictures. Shown below is the series of operations or the selecting menus. The Page Button on the unit's front panel is pressed to move from the present menu to the next menu.



Display Page Functions

This unit can show the following 3 displays on the TV monitor.
(1) Date/time Display
(2) Lapsed time Display
(3) Page count Display
The Date/time Display Page normally appears on the screen when the power is set ON.

• Date/time Display Page



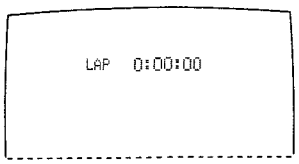
1 Date
The date appears in the sequence of day, month and year.

2 Time lapse mode
This is set using the Time Mode (▼ , ▲) Buttons on the sub-panel.

3 Time
- The time is displayed in a 24-hour "Military Time" fashion.
- The Selector Switch (24H·AM/PM) inside the unit can be used to indicate AM or PM.
  Please consult your authorized service personnel.

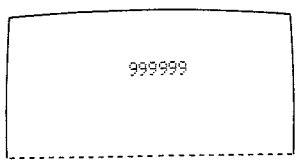
4 Number of alarms
The "A" mark signifying alarm appears only in the alarm recording mode.

• Lapsed time Display Page

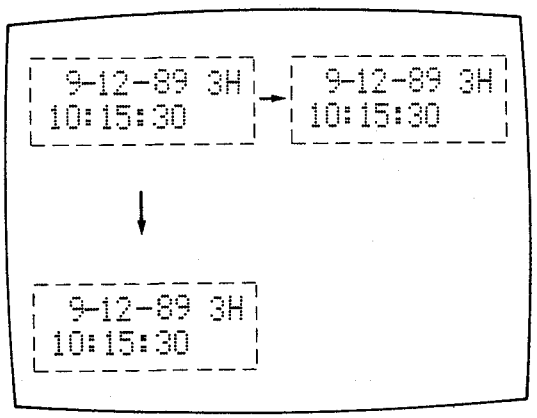


The lapsed time count is incremented in 1-second units during recording.
It can be reset to "0:00:00" by pressing the Alarm/Power Loss Reset Button.

• Page count Display Page



The page count is incremented once with every shot (every field) during recording.
("Once every shot" denotes the recording of the number of fields set in the (1SHOT) FIELD item on the Menu 3.)
The page count can be reset to "0" by pressing the Alarm/Power Loss Reset Button.



- The date/time display, lapsed time display or page count display can be moved down the screen or to the right of the screen using the Shift/Position (↓, →) Button, respectively.
- If the position of the date/time display is set too close to the outer edges of the monitor screen as shown in Fig. 1, the synchronization may be impaired as a result, depending on the type of TV monitor used.
  Also, the colour may disappear and re-appear repeatly, and other such phenomena may occur. Make sure, therefore, that the position of the date/time display is set as shown in Fig. 2.
- We recommend to set the position of the date/time display after you had input a video signal to the Video Input Connector.

TV Monitor

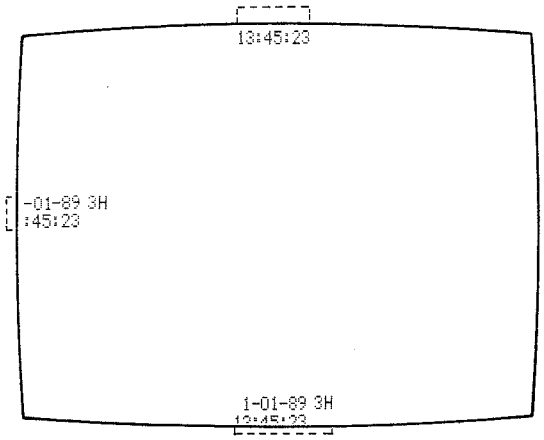


Fig.1

TV Monitor

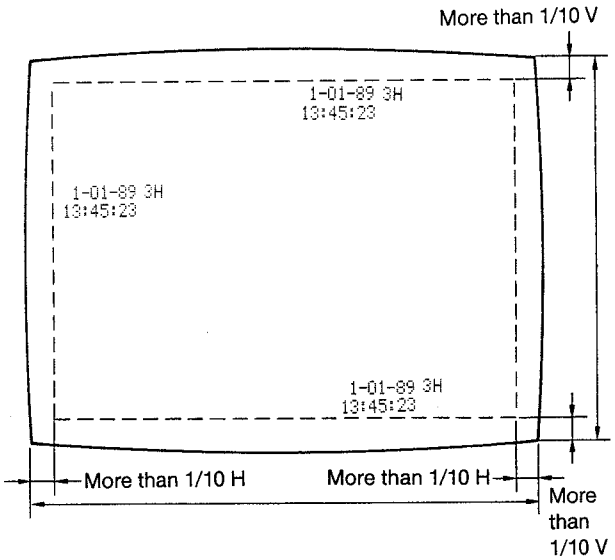
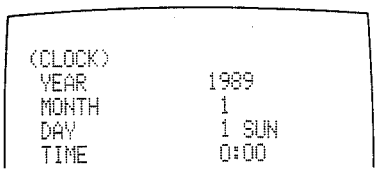
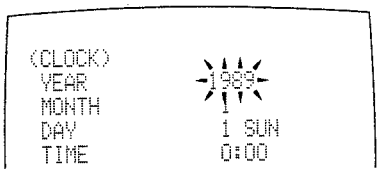
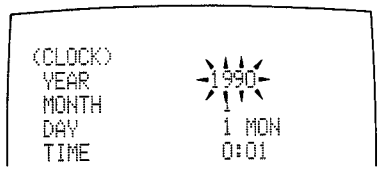
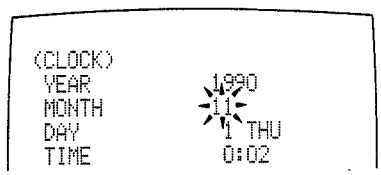
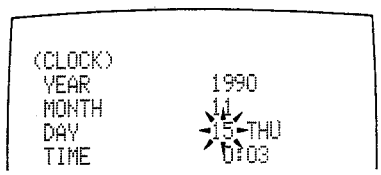


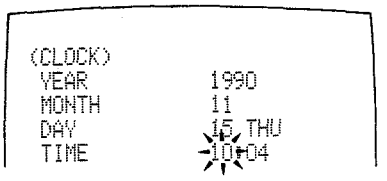
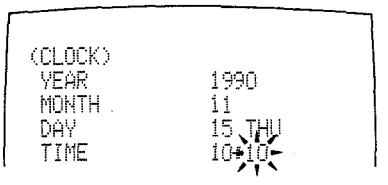
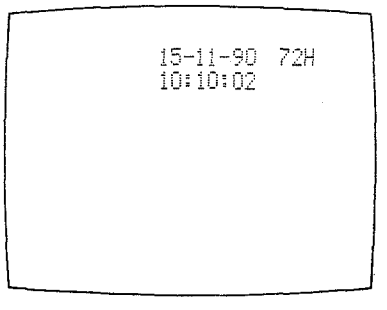
Fig.2

Date and Time Settings

Since this unit is equipped with a time date generator, the date and time can be superimposed during recording.

After the power has been switched on, the normal picture indicating the date (Day/Month/Year), time of day and time mode now appears, as described in the previous picture.
When the Page Button is pressed once from the normal picture, the next menu appears.

Step	Operation Ex. The procedure for setting the date to Thursday, 15 November, 1990 and the time to 10:10. The Time Mode is set to "72-hour".	Display on TV Monitor
1	Press the Page Button until Menu 1 appears. 	
2	"YEAR" flashes when the Shift/Position (↓) Button is pressed on Menu 1. 	
3	Set the year to "1989" using the Set (+ or −) Button. When this has been set, the day of the week display at the "DAY" position also changes. 	
4	"MONTH" flashes when the Shift/Position (↓) Button is pressed. Press the Set (+ or −) Buttons to set the month to "11". When this has been set, the day of the week display at the "DAY" position also changes again. 	
5	"DAY" flashes when the Shift/Position (↓) Button is pressed. Press the Set (+ or −) Buttons to set the day to "15". 	

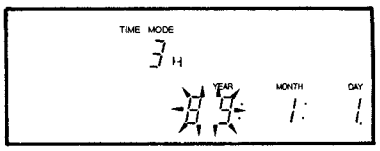
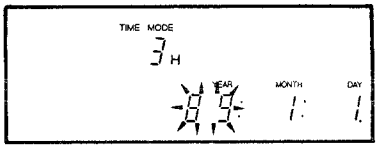
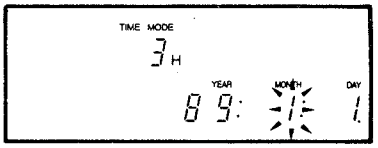
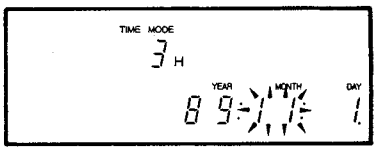
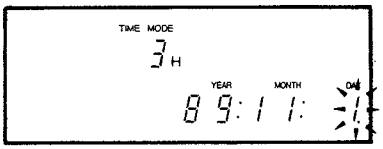
Step	Operation	Display on TV Monitor
6	The "hour" part of "TIME" flashes when the Shift/Position (↓) Button is pressed. Press the Set (+ or −) Buttons to set the hour to "10". 	
7	The "minute" part of "TIME" flashes when the Shift/Position Button (→) is pressed. Press the Set (+ or −) Buttons to set the minutes to "10". 	
8	Operation now starts at the set date and time of day when the Page Button is pressed. 	

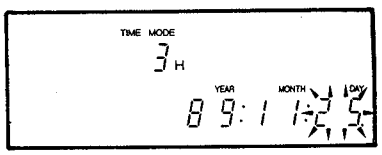
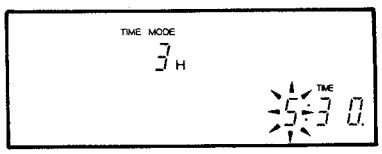
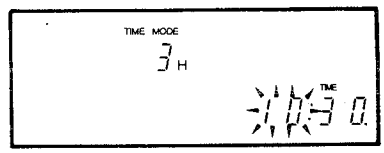
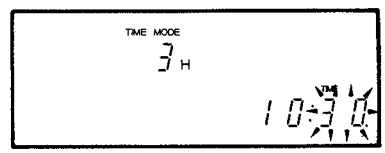
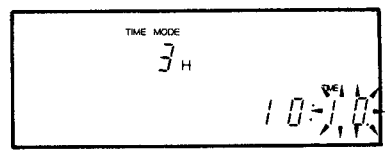
When you want to cancel the display
The displays on the Menu 2 can be cleared block by block.
(See page 23.)

Notes:
- The date and time of day and other display information can be backed up in the event of a power failure for about 1 month. In order for memory back up to work properly power must be supplied to the unit for at least 15 hours prior to power loss or interruption. When the unit is purchased or if the unit is not used in the long period of time, the stored memory cannot be backed up.
- Compensation for leap year is made automatically.
- The time/date generator settings cannot be made during recording.

• Date/Time Setting on Display Section

The date and time can be also set on the display section panel.

Step	Operation Ex. The procedure for setting the date to Saturday, 25 November, 1989 and the time to 10:10.	Display Section Panel
1	Press the TIME ADJ Button. "YEAR" part of date will flash in the display section. The date display will flash even on the monitor screen to denote that the setting standby mode is established. 	
2	Set the year to "89" by pressing the Set (+ or −) Button. 	
3	Press the Shift/Position (→) Button. The "MONTH" part will flash. 	
4	Set the month to "11" by pressing the Set (+ or −) Button. 	
5	Press the Shift/Position (→) Button. The "DAY" part will flash. 	

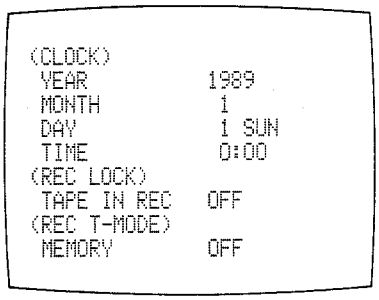
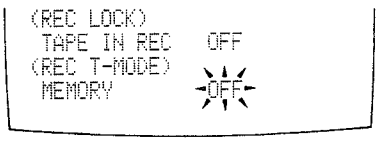
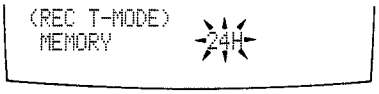
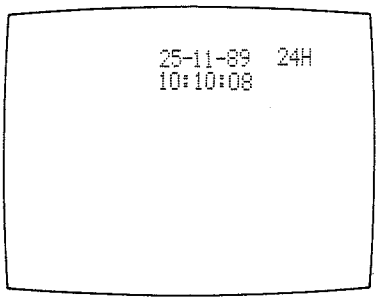
Step	Operation	Display Section Panel
6	Set the day to "25" by pressing the Set (+ or −) Button. 	
7	Press the Shift/Position (→) Button. Operation switches to the time setting display, and the "hour" part of TIME will flash. The time display will flash even on the monitor screen to denote that the setting standby mode is established. 	
8	Set the hour to "10" by pressing the Set (+ or −) Button. 	
9	Press the Shift/Position (→) Button. The "minute" part of TIME will flash. 	
10	Set the hour to "10" by pressing the Set (+ or −) Button. 	
11	Press the TIME ADJ Button. Operation starts at the set date and time of day. 	

•The year setting mode does not follow after "minute" part has been set. This means that if any change is to be made after the settings have been completed and the second count has started, the whole procedure should be repeated so that the appropriate change can be made.

Time Mode Settings

The time mode must be set before proceeding with time lapse recording/playback. When the recording time mode is to be fixed and recording is to proceed, this menu memorizes the time mode and enables forced recording. Referring to the table below,select the mode which is best suited for the application at hand.

Time Mode Setting

Step	Operation	Display on TV Monitor
1	Press the Page Button until Menu 1 appears. 	
2	Press the Shift/Position (↓) Button until the (REC T-MODE) MEMORY line indicator flashes. 	
3	Press the Set (+, −) Button and select the Recording time mode. The time mode can be changed as desired at any time even during recording. OFF → 3H → 14H → 24H → 48H → 72H → 120H → 180H → 240H → 480H → 000H → OFF →... 	
4	Press the Page Button until the normal picture appears. 	

- When "OFF" is selected, any recording mode can be set using the time mode buttons on the sub-panel at the front of the unit.
- Any setting from "14" to "480" will be forceably recorded in the time lapse mode.
- When "000H" is selected, recording is forced in the 1-shot mode.
- When "3H"~"480H" or "000H" is set, it is impossible to change the time mode during recording.

Time Mode Selection

Check the following before time lapse record/playback operation. Select the mode according to the purpose with reference to the table shown below.

Mode		Possible recording time (hours) NV-E180	NV-E120	NV-E90	Video Record intervals (sec.)	Audio Recording	Camera switching Interval*1 (sec.) TIMING 1	TIMING 2	Tape Running Method
3H		3	2	1.5	1/50	Possible	—	—	Continuous running 23.39 mm/sec
14H		14	9	7	0.1	Not possible	0.2	0.1	Intermittent running
24H		24	18	12	0.16	Not possible	0.32	0.16	Intermittent running
48H		48	36	24	0.32	Not possible	0.64	0.32	Intermittent running
72H		72	54	36	0.48	Not possible	0.96	0.48	Intermittent running
120H		120	90	60	0.8	Not possible	1.6	0.8	Intermittent running
180H		180	135	90	1.2	Not possible	2.4	1.2	Intermittent running
240H		240	180	120	1.6	Not possible	3.2	1.6	Intermittent running
480H		480	360	240	3.2	Not possible	6.4	3.2	Intermittent running
000H (1 SHOT) *2	Manual	About 180	About 120	About 90	About 1.0	Not possible	About 2.0	About 1.0	Intermittent running
	Auto 1 min	9000	6750	4500	60	Not possible	120	60	Intermittent running
	Auto 2 min	18000	13500	9000	120	Not possible	240	120	Intermittent running
	Auto 3 min	27000	20250	13500	180	Not possible	360	180	Intermittent running

*1: This unit can select "TIMING1" or "TIMING2" as the camera switching timing. A selector switch is provided for this purpose inside the unit. Consult with your local dealer as to its setting. When the unit is shipped from the manufacturing plant,the switch is set to "TIMING2".

*2 **"Manual":** Perform the 1-shot recording by pressing the Record Button or inputting a low-level signal (L) using the remote control switch. Refer to the step 6~7 on page 38.

"Auto 1 min": Perform the 1-shot recording by setting the record interval to any of 1, 2 or 3 minutes for the "(1 SHOT) INTERVAL".
"Auto 2 min" Refer to the step 4 on page 38.
"Auto 3 min"

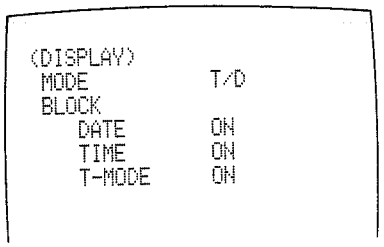
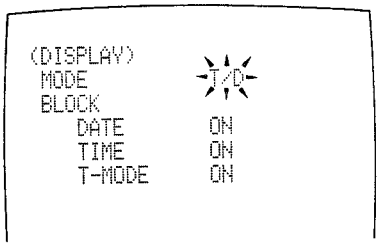
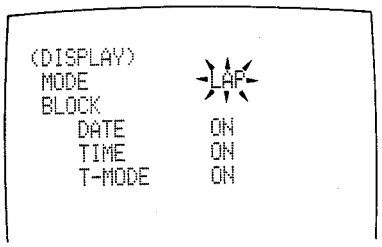
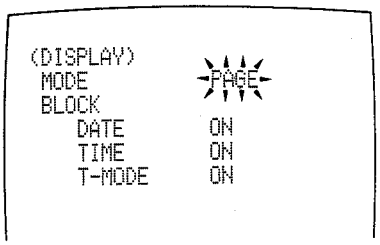
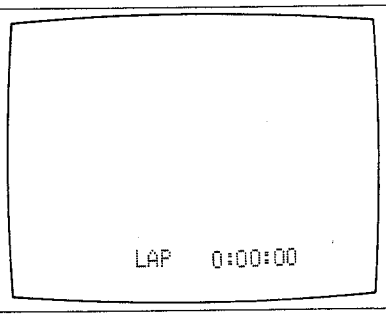
- This unit is designed to be used for the cassette tape NV-E180.
- The possible recording time will differ depending on the type of video cassette used.
- In the 3-hour mode, the tape will travel continuously and so sound can be recorded.
- The 14-, 24-, 48-, 72-, 120-, 180-, 240-, 480-hour and 1-shot modes are time lapse modes. The pictures are recorded on a field-by-field basis, and long-time recording and playback are possible.
- Tape recorded in the time lapse mode can be played back quickly in the SP mode.
- Tape recorded in the VHS mode can be played back in slow motion in the time lapse mode.

Normal Picture Settings

Normal picture will be displayed in two ways as shown below:

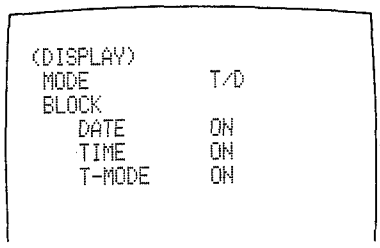
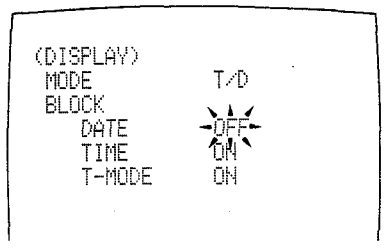
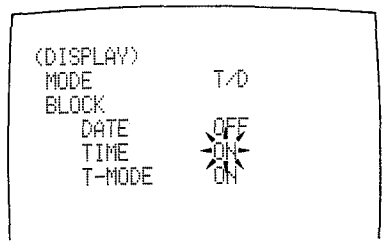
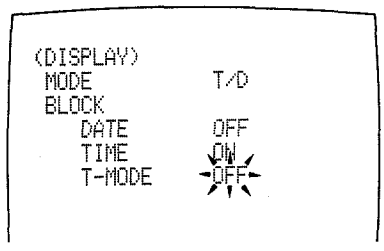
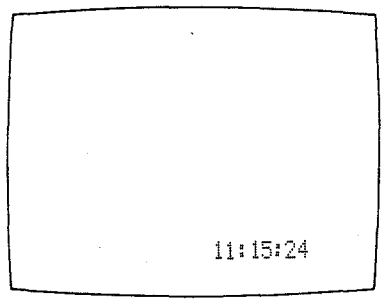
(1) Selection of the menu page display mode (date/time display page, lapsed time display page, page count display page).
(2) Selection of the block displays for the date/time display page.
However, when selecting page count display page, be sure to set the time mode to "000H" (1-shot mode) pressing the Time Mode Button on the sub-panel.

• Selection of Normal Picture Display

Step	Operation	Display on TV Monitor
1	Press the Page Button until Menu 2 appears. 	
2	Press the Shift/Position (↓) Button. The "T/D" indicator in the "(DISPLAY) MODE" line will flash. The selection of date/time display page can be selected during the flashing of the "T/D" indicator. 	
	In order to select the lapsed time display page, press the Set Button again. The "LAP" indicator in the "MODE" line will flash. 	
	In order to select the page count display page, press the Set Button again. The "PAGE" indicator in the "MODE" line will flash. •Selection is possible only when the time mode has been set to "000H" by pressing the Time Mode Button. 	
3	Press the Page Button 4 times. The selected display page will appear. 	

• Menu Page Block Display Setting (Date/time display page Only)

• Block displays for the date/time display page settings are as follows.

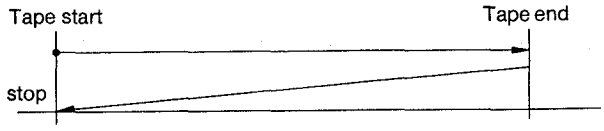
Step	Operation	Display on TV Monitor
1	Press the Page Button until Menu 2 appears. 	
2	Press the Shift/Position (↓) Button until the "(DISPLAY) BLOCK DATE" line indicator will flash. "ON": The date will be displayed. "OFF": The date will not be displayed.	
3	Press the Shift/Position (↓) Button. The "TIME" line indicator will flash. Then press the Set Buttons and select whether to display the time of day. "ON": The time of day will be displayed. "OFF": The time of day will not be displayed.	
4	Press the Shift/Position (↓) Button. The "T-MODE" line indicator will flash. Then press the Set Buttons and select whether to display the time mode. "ON": The time mode will be displayed. "OFF": The time mode will not be displayed.	
5	Press the Page Button 4 times. The selected date/time display will appear in blocks. 	

VTR Mode Selection After the Tape End Detection

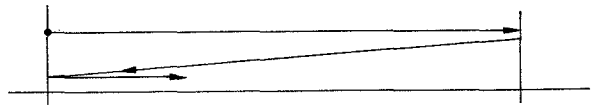
When the video cassette tape has advanced to the end during recording, one of the following operations can be selected. Select the STOP, BUZZER, REW (rewinding) or REPEAT (rewinding and recording) mode.

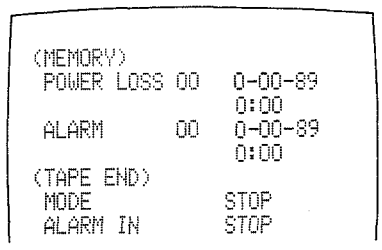
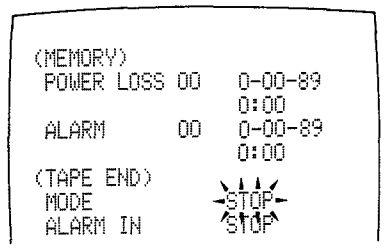
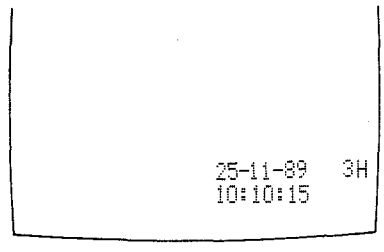
1. STOP ..... The tape will stop when it comes to the end.
2. BUZZER ..... The tape will stop when it comes to the end and the buzzer will sound. This mode is set to safeguard against the possibility that the operator will forget to replace the cassette tape.
   The buzzer can be made to stop sounding by pressing the Operation Buttons (Stop Button, Eject Button, Fast Forward Button or Rewind Button).

3. REW (rewinding) ..... The tape will be rewound to its start and VTR stops. (See page 40.)



4. REPEAT (repeat recording) ..... The tape will be rewound to its start and recorded again. (See page 39.)



Step	Operation	Display on TV Monitor
1	Press the Page Button until Menu 5 appears. 	
2	Press the Sift/Position (↓) Button until the "(TAPE END) MODE" line indicator begins to flash, and select the mode by pressing the Set (+, −) Button. VTR mode can be selected as follows: STOP → BUZZER → REW → REPEAT → STOP → ... 	
3	Press the Page Button until the normal picture appears. 	

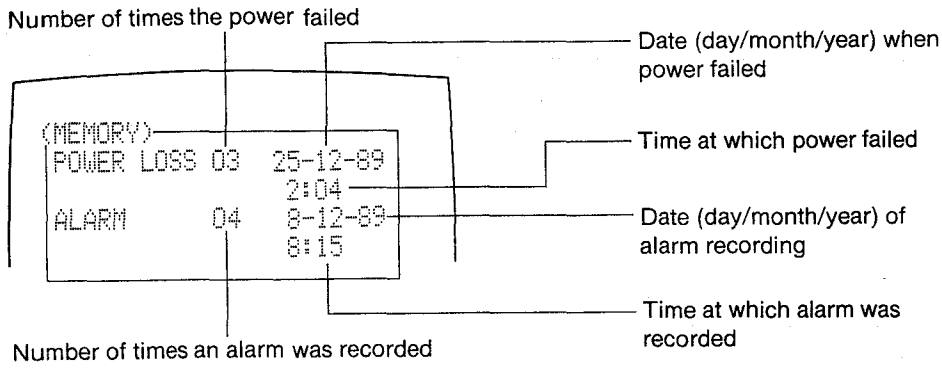
- The following actions cannot be taken while the tape is being rewound:
  The memory stop for the counter functions will not work.
  Only a few operation buttons will work when the Recording Mode Lock Switch has been set to the "1" or "2" position.

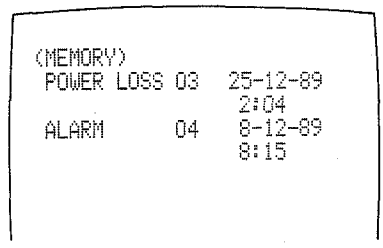
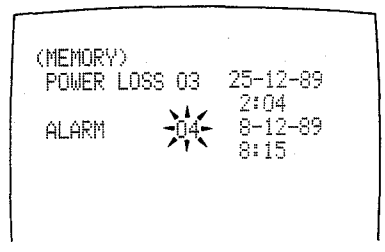
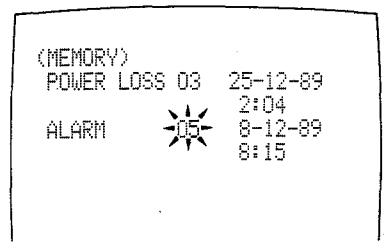
Verifying the Data entered in the Memory

In either of the two situations described below, the number of occurrences and data relating to the past 4 occurrences can be entered on Menu 5.
The entered data can be checked by displaying this page on the screen.

① **POWER LOSS** (power failure): ..... The number of times the power has failed and the times at which the 4 past power failures occurred.

② **ALARM** (alarm recording): ..... The number of alarm recordings and the times at which the past 4 alarms were recorded.


Number of times the power failed
Date (day/month/year) when power failed
(MEMORY)
POWER LOSS 03 25-12-89
2:04
ALARM 04 8-12-89
8:15
Time at which power failed
Date (day/month/year) of alarm recording
Time at which alarm was recorded
Number of times an alarm was recorded

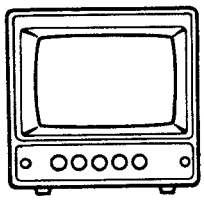
Step	Operation	Display on TV Monitor
1	Press the Page Button until Menu 5 appears.	
2	Press the Shift/Position (↓) Button until the "POWER LOSS" or "ALARM" line indicator begins to flash.	
3	Press the Set (+, −) Button and you can verify the date in the memory.	

•To reset the data, first proceed to each of the items which are to be reset and for each item press the Alarm/Power Loss Reset Button on the sub-panel for resetting.

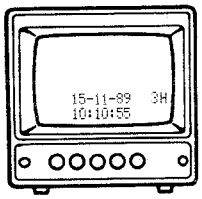
Recording

1 Apply power to all connected equipment.

2 Adjust so that the picture from the video camera correctly appears on the TV monitor.



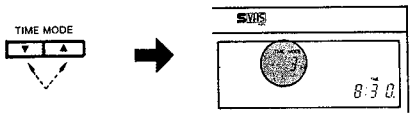
3 Make sure that the date and time displayed in the TV monitor is correct.



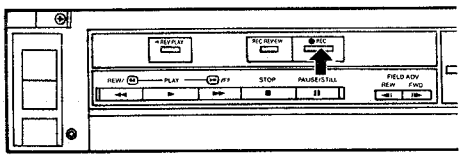
4 Select the recording modes such as Timer, Auto Repeat, Alarm, External-Timer Rec and Mode Lock.

5 Insert a video cassette into this unit.
Check whether the safety tab on the cassette tape which is about to be inserted has been broken out.
Check that the record safety tab on the cassette tape is intact.

6 Select the recording time mode.
(3, 14, 24, 48, 72, 120, 180, 240, 480, 000 HRS.)



7 Press the Record Button.



Note

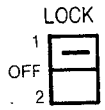
- When the Pause/Still Button is pressed during recording mode, the tape will be shifted to the pause mode. If this state of operation continues for about 5 minutes or more, the unit will be automatically shifted to the stop mode. (To prevent possible damage to tape and recorder.)
- If the Record Button is pressed after pressing the Pause/Still Button during playback, the picture is changed to E-E. In that case, press the Pause/Still Button again to shift the mode to the recording mode.
- Any operation can be selected during recording when setting (REC T-MODE) to "OFF".
- If the tab on the video cassette to be inserted has been broken out, the unit will be placed in the ejection mode and the video cassette will be ejected from the cassette holder.
- Be sure to press the Stop Button before setting the timer recording.
- The Auto-Repeat recording, power failure reset recording and alarm recording are operational during recording.
- If the unit is in the recording mode again after stopping during time lapse recording mode with the Pause/Still Button, it will not be possible to obtain seamless-cut recordings.
- If the power failure is reset within a month, the unit will continue recording in the same recording time mode. However, this works when the power is supplied to this unit more than 15 hours.
- Please note the following points when performing the auto repeat recording.
  Timer recording cannot be performed during auto-rewind.
  The buzzer will not sound when the tape reaches its end.
  Although alarm recording is usually not possible during auto rewinding, it can still be conducted by setting a selector switch inside the unit.
  For details, consult with your authorized service personnel.
- During alarm recording, only the Time Mode Buttons will not be operational.
- In case of auto repeat and timer recording, remember to perform daily maintenance. (For the daily maintenance, refer to page 53.)

Better Recording

This unit is equipped with safety and monitoring functions which enable better long time recording confidence. So, carefully read the instruction given below.

Recording Mode Lock

Used to prevent accidental interruption of recording (other than power failures) during long term unattended use.
(Refer to page 29.)



Power Failure Reset Recording

When the power fails during recording

- If the power failure lasts less than a month, the unit will automatically start recording after the power has been restored.
- Video head and tape protection functions during power failure.
- Depending on the selection of the Recording Mode Selector Button, the operating modes may differ before and after the power has been restored following a power failure.

•When "EXT TIMER" is selected:

Before the power failure	After power has been restored
Stop, Play, Rec, FF, REW modes	Unit is placed in recording mode
Auto rewinding mode during auto repeat recording	Unit is placed in recording mode once tape has been rewound to beginning

•When no Recording Mode Indicator is displayed:

Before the power failure	After power has been restored
Stop, Play, FF, REW modes	Unit is placed in stop mode
Rec mode	Unit is placed in recording mode
Auto rewinding mode during auto repeat recording	Unit is placed in recording mode once tape has been rewound to beginning

However, when the power failure lasts for more than 1 month and then the power is restored, the unit will always go into stop mode at the actual tape position.

Recording Monitor

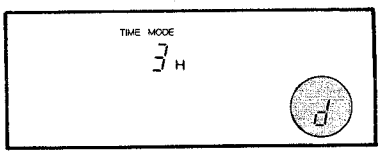
You can check the recorded pictures during recording by pressing the Rec Review Button on the unit's sub-panel.

Hour Meter

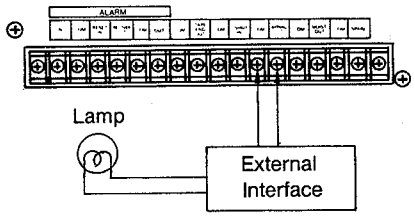
This is useful for proper scheduling of maintenance for the unit.

Warning

The unit's abnormal condition detection
You can detect abnormalities (moisture, cylinder lock, tape feed trouble, capstan motor trouble) in the unit if any.



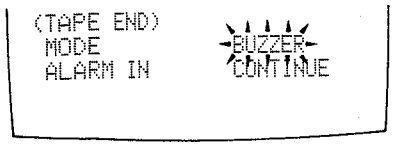
" d " or an error from " E - 2 " to " E - 6 " appears on the display.



For remote or back up monitoring of abnormal conditions
Connect an external interface and alarm lamp between the warning output terminal and ground terminal.
Refer to page 47 for information on the output terminal.

Tape End Detection Buzzer

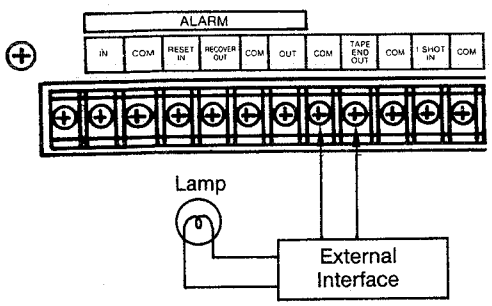
Indicates that the tape has reached its end and has to be replaced.



Set "(TAPE END) MODE" on the Menu 5 to "BUZZER". The buzzer will sound once the tape has reached its end. Refer to page 24.

Tape End Detection Output Terminal

Informs you that the tape has reached its end during recording through an external alarm lamp or buzzer.

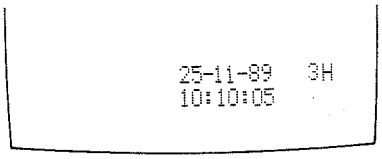


Connect an external interface and alarm lamp between the tape end detect signal output terminal and ground terminal. Refer to page 47 for information on the output terminal.

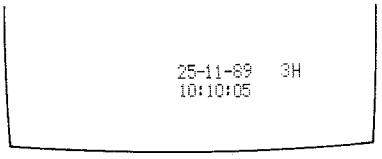
Display of the Date/Time (Lapse time, Page count) in Smaller Characters

Displays the date/time, lapse time, and page count in smaller characters on the TV monitor.
Consult your authorized service personnel for information on setting the display (LARGE or SMALL) selector switch in the unit.

LARGE (Normal size)

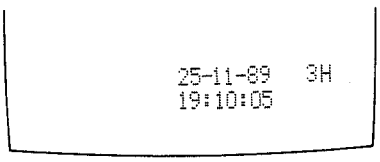


SMALL

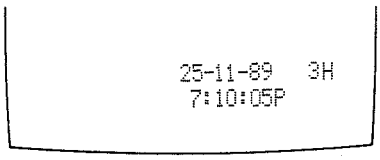


Display of Time on the Date/Time Display Page

24-time



AM/PM

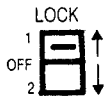
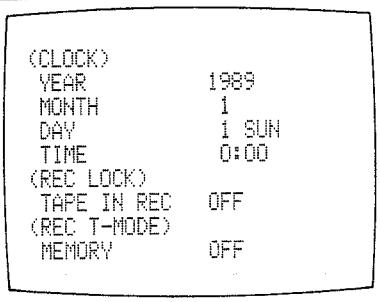
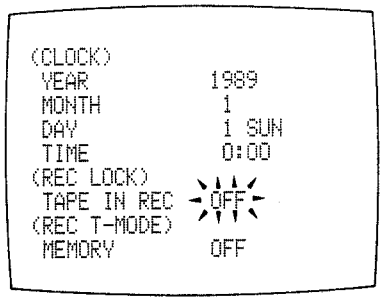
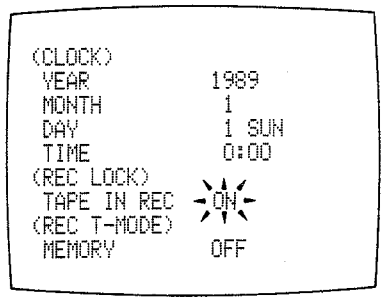
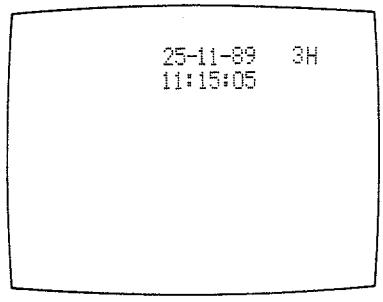


Consult your authorized service personnel for information on setting the display (24-time or AM/PM) selector switch in the unit.

Automatic Recording

This unit can start the recording automatically after the cassette tape is inserted into the unit.

Automatic Recording Operation

Step	Operation	Display on TV Monitor
1	Select the Recording Mode Lock Switch on the front panel to "1" or "2".  1: REC REVIEW or PAGE button is operative during recording. 2: EJECT, REC REVIEW or PAGE button is operative during recording.	
2	Press the Page Button until the Menu 1 appears. 	
3	Press the Shift/Position (↓) Button until the "(REC LOCK) TAPE IN REC" line indicator begins to flash. 	
4	Set the "OFF" indicator to "ON" by pressing the Set (+, −) Button. 	
5	Press the Page Button until the normal display appears. 	

Be sure that the cassette is ejected if the tape's erasure prevention tab has been broken.

Timer Recording

The timer recording mechanism functions in 2 ways—internal and external timer recordings.

• Internal Timer Recording

Start and end times

Bear in mind the following points when setting the start and end times.
•When the end time setting is later than the start setting:

Recording will commence at the start time on the day concerned and stop at the end time on the same day.

Example: 8:30 < 17:00

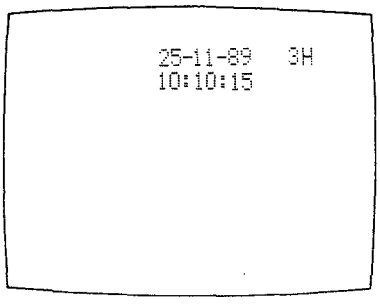
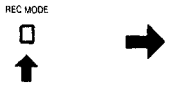
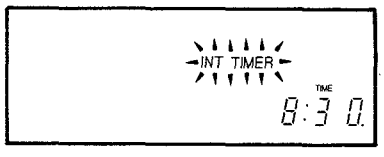
•When the start time setting is later than the end time setting or when the two times are the same:
Recording will commence at the start time on the day concerned and stop at the end time on the following day.

Example: 17:00 > 8:30

•The weekly timer is able to set a programme on each day of the week.
•When the weekly timer and daily timer are both set OFF, no display appears for the start time or end time.
•The input data will be memorized semipermanently.

Internal Timer Record Setting/Operating

Step	Operation	Display on TV Monitor
1	Check that the video cassette has been inserted.	
2	Check that the present time appears correctly on the monitor screen.	25-11-89 24H 10:10:08
3	Press the Page Button until Menu 4 appears. PAGE	(TIMER) START STOP SUN OFF MON OFF TUE OFF WED OFF THU OFF FRI OFF SAT OFF DLY OFF

Step	Operation	Display on TV Monitor
4	Set the internal timer starting time. •For settings, see "Daily Timer" or "Weekly Timer" sections. See page 32~35.	
5	Press the Page Button until the normal picture appears. 	
6	Press the Recording Mode Selector Button on the front panel and light "INT TIMER" on the display. Internal timer recording has been set.  	

The unit's condition after the setting.

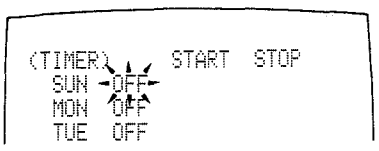
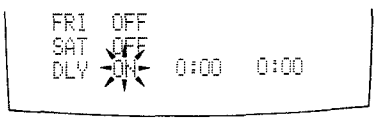
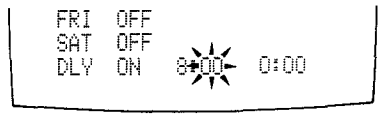
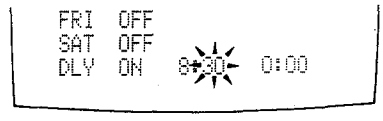
- The unit's power will be OFF and the function key will not work even if they are pressed.
- If the operating time has not been set, the video cassette has not been inserted or its accidental erasure prevention tab has been broken, the buzzer will sound and "INT TIMER" will flash.

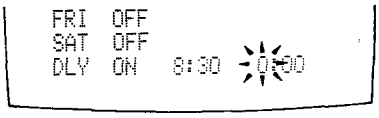
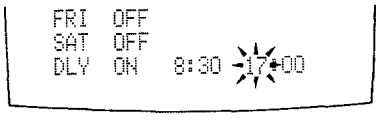
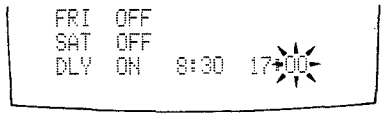
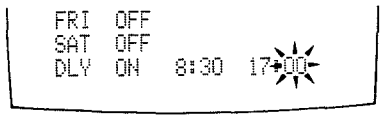
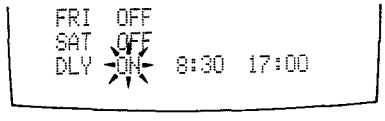
To cancel the internal timer mode.

Press the Recording Mode Selector Button on the front panel and turn off the "INT TIMER" indicator on the display.

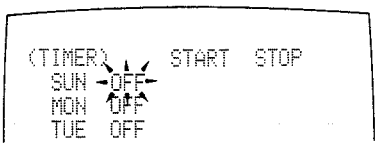
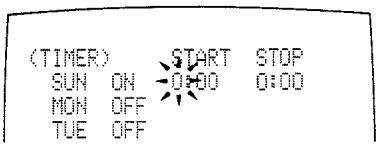
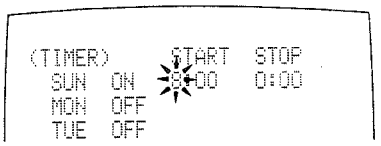
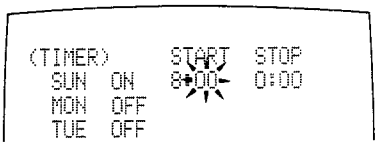
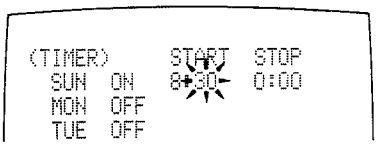
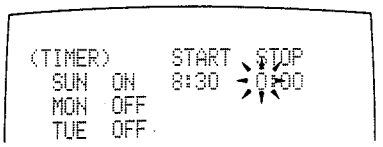
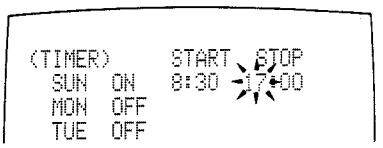
The timer recording mechanism functions in 2 way—recording during the same time every day (daily timer) or during the same time of each day of the week (weekly timer).

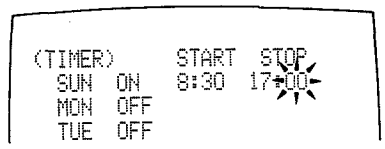
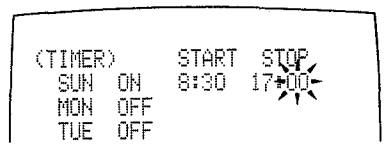
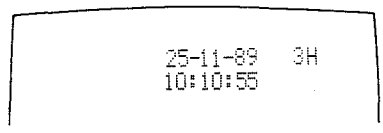
• Daily Timer (Every Day Recording)

Step	Selection and Operation Starting every day at 8:30 and ending at 17:00 (5:00 p.m.) (daily timer)	Display on TV Monitor
1	Press the Shift/Position (↓) Button until "OFF" starts flashing at the "SUN" (Sunday) position. 	
2	Press the Shift/Position (↓) Button 7 times until it moves to "DLY" (daily). If "OFF" is displayed, press the Set (+ or −) Button to display "ON". 	
3	When the Shift/Position (→) Button is pressed, setting moves on the start time and the section corresponding to the "hours" flashes. 	
4	Press the Set (+ or −) Button to set the hours to "8". 	
5	When the Shift/Position (→) Button is pressed, the section corresponding to the "minutes" flashes. 	
6	Press the Set (+ or −) Button to set the minutes to "30". 	

Step	Selection and Operation	
7	When the Shift/Position (→) Button is pressed, setting moves on to the end time and the section corresponding to the "hours" flashes. 	
8	Press the Set (+ or −) Button to set the hours to "17". 	
9	When the Shift/Position (→) Button is pressed, the section corresponding to the "minutes" flashes. 	
10	Press the Set (+ or −) Button to set the minutes to "00". When the display reads "00", press the Shift/Position (→) Button. 	
11	When the Shift/Position (→) Button is pressed, setting returns to "ON" which starts flashing. •The buzzer will sound and "INT TIMER" will flash on and off if the operating time has not been set, the video cassette has not been inserted or the accidental erasure prevention tab has been broken out. The operating time of the internal timer has now been set with this procedure. Press the Page Button twice. The normal picture will appear. 	

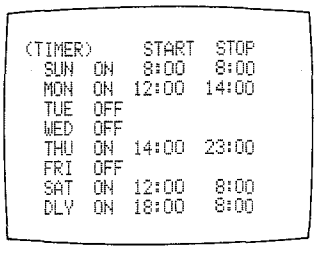
• Weekly Timer (Each Day of the Week Recording)

Step	Selection and Operation Starting at 8:30 and ending at 17:00 (5:00 p.m.) from Sunday through Thursday, and starting at 9:00 and ending at 12:00 on Friday and Saturday (weekly timer)	Display on TV Monitor
1	Press the Shift/Position (↓) Button until "OFF" starts flashing at the "SUN" (Sunday) position. Press the Set (+ or −) Button so that "ON" will be displayed. 	
2	When the Shift/Position (→) Button is pressed, setting moves on to the start time and the section corresponding to the "hours" flashes. 	
3	Press the Set (+ or −) Button to set the hours to "8". 	
4	When the Shift/Position (→) Button is pressed, the section corresponding to the "minutes" flashes. 	
5	Press the Set (+ or −) Button to set the minutes to "30". 	
6	When the Shift/Position (→) Button is pressed, setting moves on to the end time and the section corresponding to the "hours" flashes. 	
7	Press the Set (+ or −) Button to set the hours to "17". 	

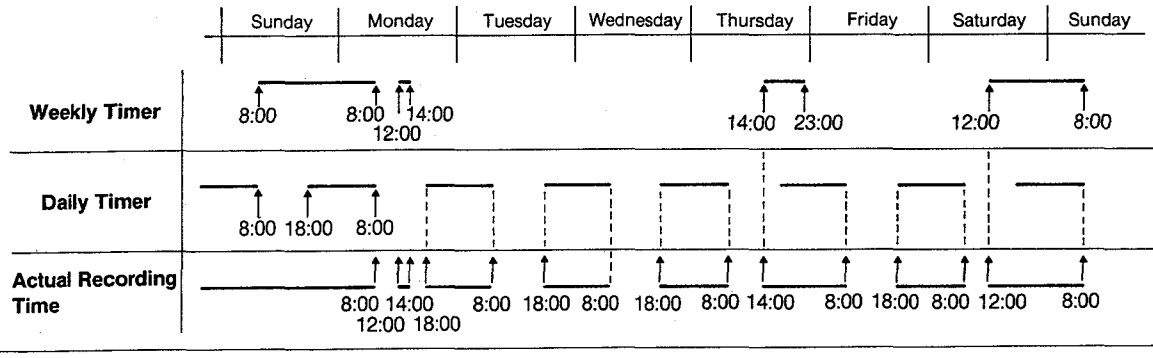
Step	Selection and Operation	
8	When the Shift/Position (→) Button is pressed, the section corresponding to the "minutes" flashes.	
9	Press the Set (+ or −) Button to set the minutes to "00".	
10	Following steps 1 to 9, set a start time of "8:30" and an end time of "17:00" from Monday ("MON") through Thursday ("THU"). Following the same procedure, set the start and end times for Friday ("FRI") and Saturday ("SAT").	
11	The operating time of the internal timer has now been set. Press the Page Button twice. The normal picture will appear.	

Example of mixed daily and weekly recording

- The timer recording will be as below, depending on the times which have been set.



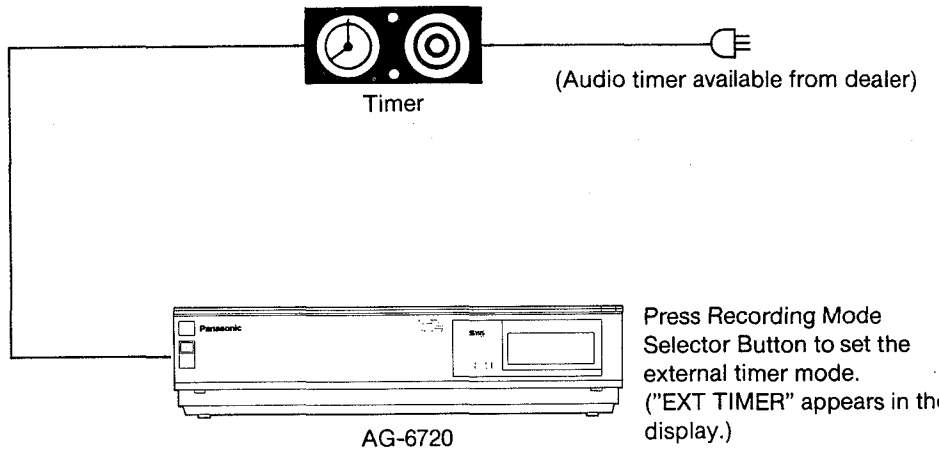
If the timer recording is set as the example, the daily/weekly timer recordings and the actual recording time will be as shown below.



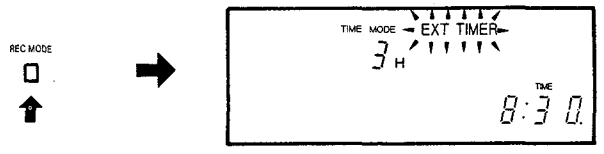
The times for each day of the week can be displayed and checked every week for each day concerned.

External timer recording

Once "EXT TIMER" appears on the display, proceed to connect the timer device. Power will be supplied from the external timer and the unit will be in the recording mode.


Timer
(Audio timer available from dealer)
Panasonic
AG-6720
Press Recording Mode Selector Button to set the external timer mode. ("EXT TIMER" appears in the display.)

• External Timer Settings

Step	Operation	Display on TV Monitor
1	Check that the video cassette has been inserted.	
2	Press the Recording Mode Selector Button on the front panel and light "EXT TIMER" on the display. 	

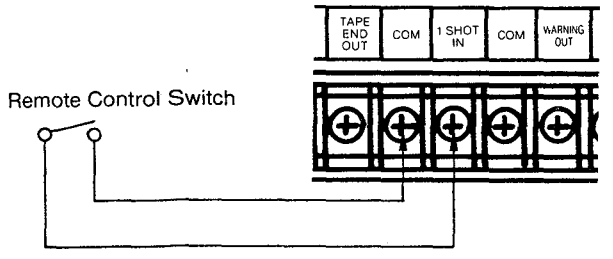
Note:

- If the video cassette has not been inserted or if its accidental erasure prevention tab has been broken out, the buzzer will sound and "EXT TIMER" will flash.

1-Shot Recording

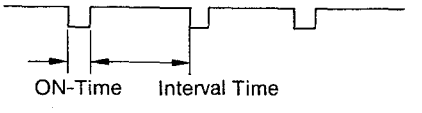
The 1-shot recording function can be used for data file or animation other than long-time recording in the time lapse mode. This operation can be performed by connecting the input terminal and ground terminal.

Connection for 1-Shot Recording



- For details, contact your authorized service personnel.

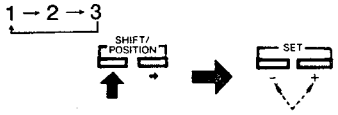
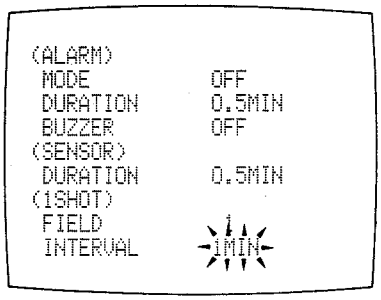
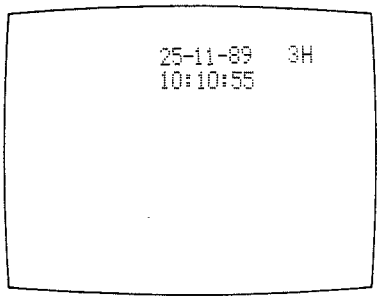
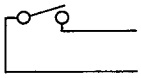
Switch-ON Time and Interval Time



- ON-time required is 100 msec.
- Interval time required is more than 1 sec depending on the number of the field recorded.
- To record continuously, set the Remote Control Switch to ON after 1-shot recording is completed.

• 1-shot recording mode settings

Step	Operation	Display on TV Monitor
1	Check that the video cassette has been inserted. Press the Time Mode (▲ or ▼) Buttons to indicate "000H" on the display. 	
2	Press the Page Button until Menu 3 appears. 	(ALARM) MODE OFF DURATION 0.5MIN BUZZER OFF (SENSOR) DURATION 0.5MIN (1SHOT) FIELD 1 INTERVAL 1MIN
3	Press the Shift/Position (↓) Button until the "(1 SHOT) FIELD" line indicator begins to flash. Then press the Set Button to select the field number for 1-shot recording. Each time the Set Button is pressed, the display will change as below: 1 → 2 → 3 → 4 → 5 → 10 → 15 → 20 → 30 → 40 → 50 → 60 	(ALARM) MODE OFF DURATION 0.5MIN BUZZER OFF (SENSOR) DURATION 0.5MIN (1SHOT) FIELD 1 INTERVAL 1MIN

Step	Operation	Display on TV Monitor
4	Press the Shift/Position (↓) Button until the "(1 SHOT) INTERVAL" line indicator will flash. Then press the Set Button to select the time intervals for 1-shot recording. Each time the Set Button is pressed, the display will change as below: 1 → 2 → 3 	
5	Press the Page Button until the normal picture appears. 	
6	Press the Record Button. The recording standby mode is established. 	
7	Press the Record Button again. 1-shot recording is established. 	To use the remote control, connect the signal to the 1-shot Input Terminal and use the remote control switch to input a low-level signal (L).  Remote Control Switch

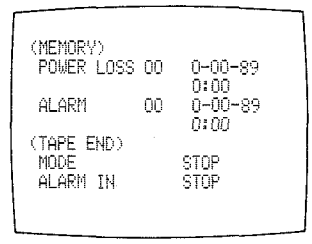
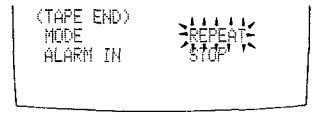
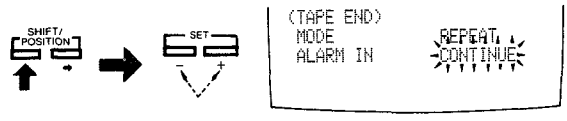
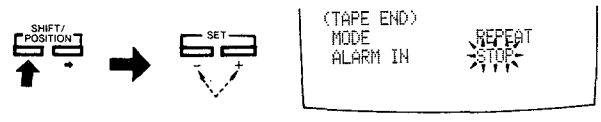
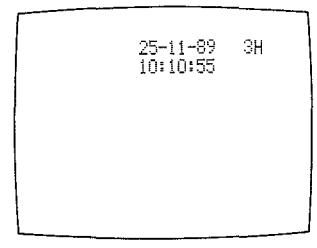
- If the Record Button is not pressed again or a low-level signal (L) is not inputted by setting the Remote Control Switch to ON within the time set for the (1 SHOT) INTERVAL, the unit will be automatically operational for 1-shot recording.
- The possible recording time in 1-shot recording mode will differ depending on the number of field and the record intervals set on this Menu 3. (See page 56.)

To cancel the 1-Shot Recording Mode

Press the Time Mode Buttons and set the time mode from "000H" to another time mode (i.e. 24H) on the display.

Auto Repeat Recording

When the cassette tape end is detected, the tape is automatically rewound to the starting point and again starts to run for repeat recording.

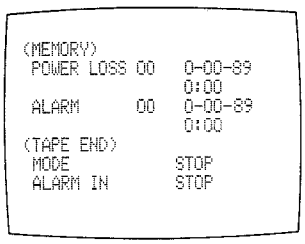
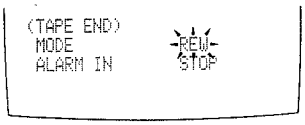
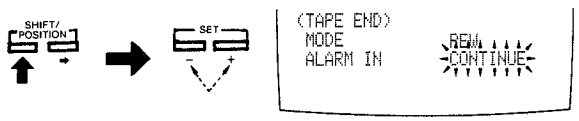
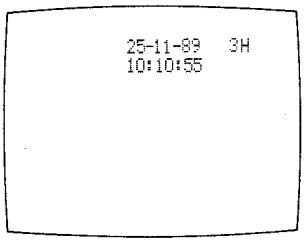
Step	Selection and Operation	
	Auto repeat recording in the same time mode, irrespective of alarm inputs.	Resetting the auto repeat recording in case of alarm input, and stopping the tape at its end.
1	Press the Page Button until Menu 5 appears. 	
2	Press the Shift/Position (↓) Button until the "(TAPE END) MODE" line indicator begins to flash, and select the "REPEAT" by pressing the Set (+, −) Button. 	
3	Press the Shift/Position (↓) Button until the "ALARM IN" line indicator begins to flash, and select the "CONTINUE" by pressing the Set (+, −) Button. 	Press the Shift/Position (↓) Button until the "ALARM IN" line indicator begins to flash, and select the "STOP" by pressing the Set (+, −) Button. 
4	Press the Page Button until the normal picture appears. 	

Note

- In case of auto repeat recording, remember to carry out the daily maintenance.
- During auto repeat rewind mode, the VTR does not accept the alarm signal. This function can be changed by the internal switch. For details, contact your authorized service personnel.

Auto Rewind Function After Recording

After recording, the auto rewind mechanism functions at the tape end. This is convenient for storing recorded tape.

Step	Selection and Operation	
	Engaging the auto rewind function after recording.	Resetting the auto rewind function in case of alarm input, and stopping the tape at its end.
1	Press the Page Button until Menu 5 appears. 	
2	Press the Shift/Position (↓) Button until the "(TAPE END) MODE" line indicator begins to flash, and select the "REW" by pressing the Set (+, −) Button. 	
3	Press the Shift/Position (↓) Button until the "ALARM IN" line indicator begins to flash, and select the "CONTINUE" by pressing the Set (+, −) Button. 	Press the Shift/Position (↓) Button until the "ALARM IN" line indicator begins to flash, and select the "STOP" by pressing the Set (+, −) Button.
4	Press the Page Button until the normal picture appears. 	

Note

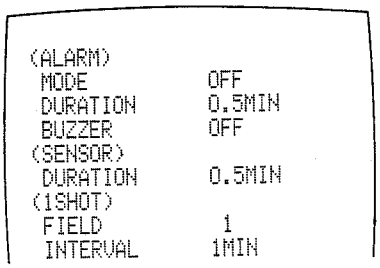
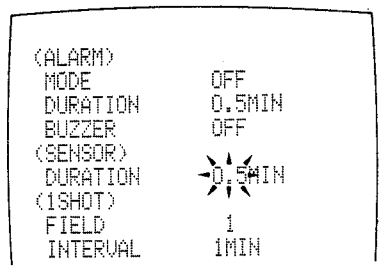
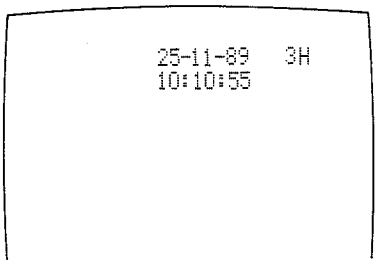
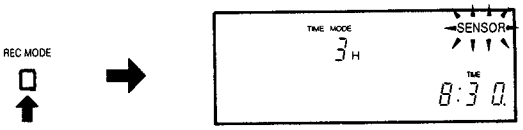
- During auto rewind mode, alarm recording does not function.
  Operation can be enabled by changing the setting of the unit's switch selector. For details, contact your authorized service personnel.

Sensor Recording

Normally, the unit is in the sensor standby mode and the power is switched off at the position where the tape has stopped moving. Connection is the same as that of the alarm recording.

When input signals are supplied to the Alarm Input Terminal, the VTR's power will be turned on. The unit is placed in the 3-hour recording mode and recording proceeds only for the time set.

Operation

Step	Operation	Display on TV Monitor
1	Press the Page Button until Menu 3 appears. 	
2	Press the Shift/Position (↓) Button until the "(SENSOR) DURATION" line indicator begins to flash, and select the recording time by pressing the Set (+, −) Button. The recording time can be selected as follows: 0.5 → 1.0 → 1.5 → 2.0 → 3.0 → CONTINUE (Note 1) → MANUAL (Note 2) 	
3	Press the Page Button until the normal picture appears. 	
4	Press the Recording Mode Selector Button on the front panel to light the Sensor Mode Indicator "SENSOR".  When the Sensor Signal is input, sensor recording starts. When the recording is finished, VTR will return to the previous mode.	

To cancel the Sensor Recording

The sensor recording can be canceled by pressing the Recording Mode Selector Button on the front panel until no display appears except the ALARM indicator.

- If the video cassette has not been inserted or if its accidental erasure prevention tab has been broken out, the buzzer will sound and the Sensor Mode Indicator "SENSOR" will flash.

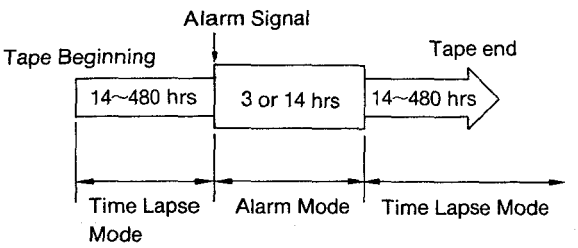
Note 1: The sensor recording continues to the tape end. When the mode "REPEAT" is selected on the (TAPE END) MODE of Menu 5, repeat recording will take place. The sensor recording can be canceled by supplying input signal to the Alarm Reset Input Terminal.

Note 2: Sensor recording proceeds while input signal is being supplied to the Alarm Input Terminal.

Alarm Recording

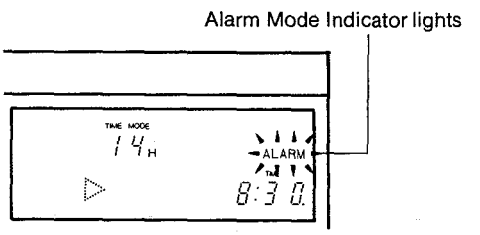
If an abnormality is encountered during long-time monitoring, the alarm will automatically function.

—Principle of Alarm Recording

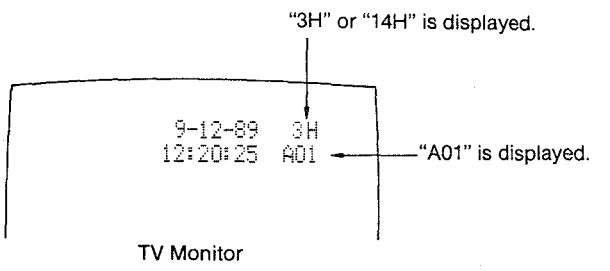


- If an alarm signal is input by the alarm sensor (door switch, interphone switch, etc.) during recording in time lapse mode, the recording speed is shifted to the high speed mode to record the state of abnormality in detail.

—Alarm and Display Given in Alarm Recording Mode

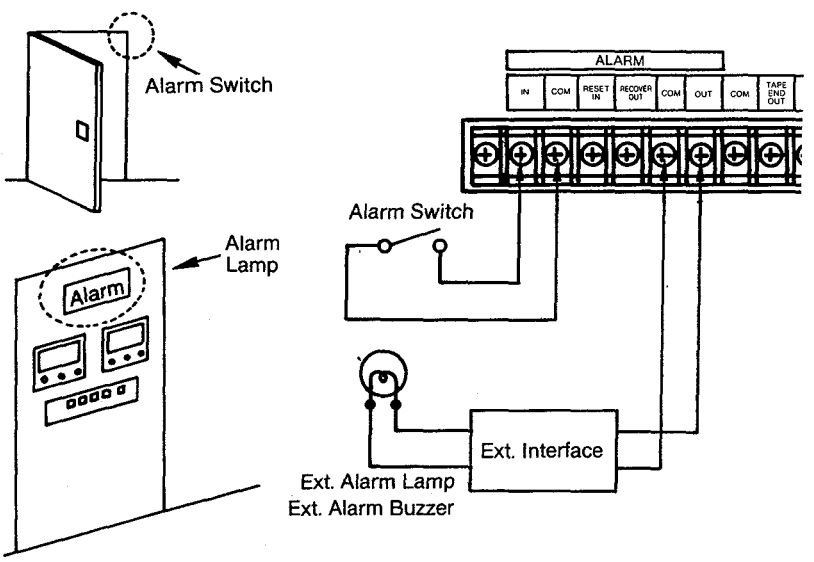


- The alarm indicator flashes even if the alarm input had been supplied once. The indicator goes out with pressing any function buttons.
  Therefore, an abnormality can be checked later.
  Press any of the function buttons to stop the flashing.



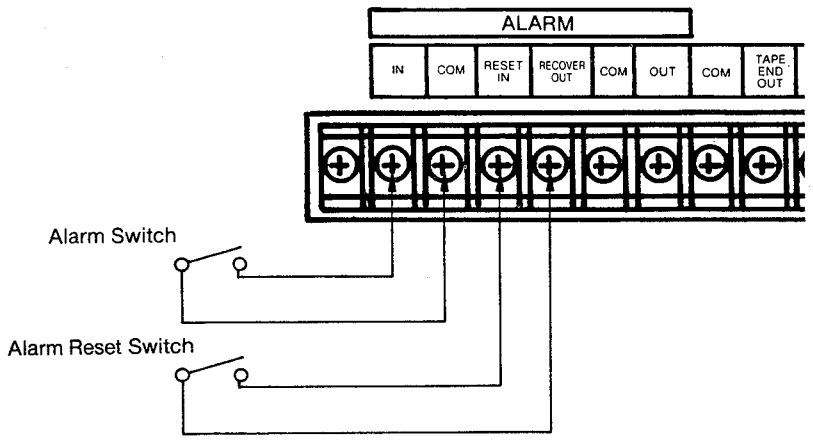
—Connection for Alarm Recording

1. Alarm Input/Output Terminals



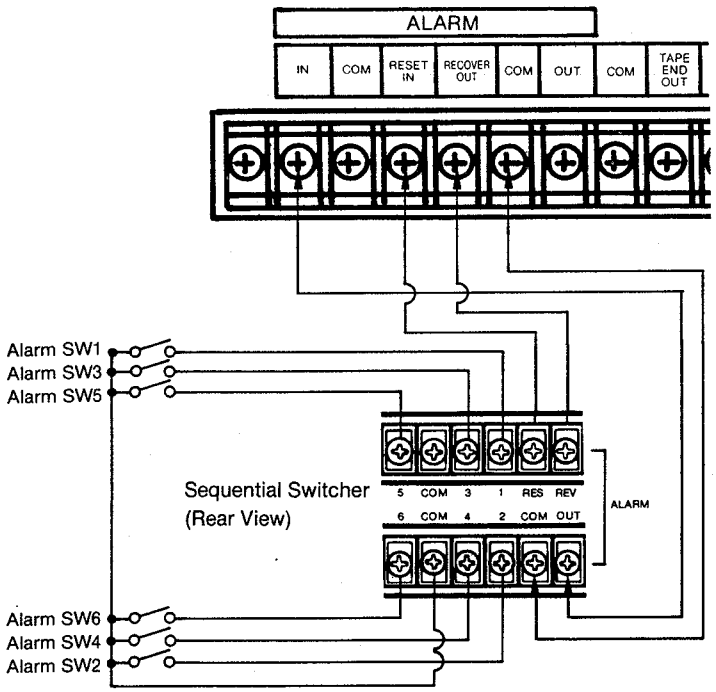
- With the alarm switch turned ON, alarm recording starts up. The alarm can be externally checked by connecting a lamp or buzzer to the Alarm Output Terminal.
- The alarm buzzer and alarm lamp used should be of +12V specifications. When using large capacity items, a relay should be installed as well.

2. Alarm Input, Alarm Reset Input Terminals



- With the alarm switch turned ON, alarm recording starts up. After that, it can be reset by setting the alarm reset switch to ON.
  Then the recording mode is shifted back to the original time lapse mode.

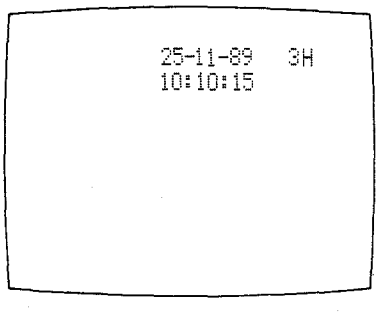
3. Alarm Input, Alarm Reset Input, Alarm Reset Output Terminals



- Used for connection of ther sequential switcher (option).
- In this case, alarm recording is done as the Alarm Switch is turned on by the alarm camera. After alarm recording, multiple cameras are automatically selected by alarm reset output.
- When connected to the sequential switcher, if the alarm recording time is set to 1 minute or less, automatic camera switching is not possible.

• Alarm recording mode settings

Step	Operation	Display on Display Section
1	Check that the video cassette has been inserted. Press the Page Button until Menu 3 is displayed on the TV monitor. 	(ALARM) MODE OFF DURATION 0.5MIN BUZZER OFF (SENSOR) DURATION 0.5MIN (1SHOT) FIELD 1 INTERVAL 1MIN
2	Press the Shift/Position (↓) Button once. The "(ALARM) MODE" line indicator will flash. Then press the Set Button and select the alarm recording mode time (3H or 14H). The "ALARM" indicator will light up on the display. When not performing alarm recording, press the Set Button to indicate "OFF" on the "MODE" line. 	(ALARM) MODE 3H DURATION 0.5MIN BUZZER OFF (SENSOR) DURATION 0.5MIN (1SHOT) FIELD 1 INTERVAL 1MIN
3	Press the Shift/Position (↓) Button. The "DURATION" line indicator will flash. Then press the Set Button and select the alarm recording time. Each time the Set Button is pressed, the display will change as below: 0.5 → 1.0 → 1.5 → 2.0 → 2.5 → 3.0 → CONTINUE*1 → MANUAL*2 	(ALARM) MODE 3H DURATION 2.0MIN BUZZER OFF (SENSOR) DURATION 0.5MIN (1SHOT) FIELD 1 INTERVAL 1MIN
4	If you want the buzzer to sound during alarm recording mode, press the Shift/Position (↓) Button to flash the "BUZZER" line indicator, then press the Set Button to select "ON". •Set to "OFF" when buzzer is not needed. 	(ALARM) MODE 3H DURATION 2.0MIN BUZZER ON (SENSOR) DURATION 0.5MIN (1SHOT) FIELD 1 INTERVAL 1MIN

Step	Operation	Display on TV Monitor
5	Press the Page Button until a normal picture appears. 	
6	Press the Record Button. Hereafter, when alarm signal is input, the unit will switch to the time mode selected in the "MODE" line and will perform alarm recording for the time selected in the "DURATION" line. If alarm recording mode is canceled, the unit will go to the mode before the alarm signal had been input.	

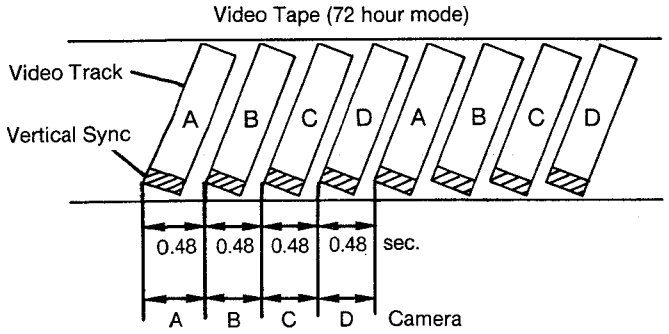
*1: •The unit will perform alarm recording until it reaches the tape end.
•If the "(TAPE END) MODE" line in Menu 5 is set to "REPEAT", the unit will establish repeat recording.
•When alarm signal is input in the Alarm Reset Input Terminal, the alarm recording will be canceled.
*2: The unit will perform alarm recording while signal is input in the Alarm Input Terminal.

Notes:
•In case of alarm recording, be sure to set the Recording Mode Lock Switch to "1" or "2".
•If you wish to cancel the buzzer during alarm recording, press any of the operation buttons on the front panel.

Sequential Switcher Connected Recording

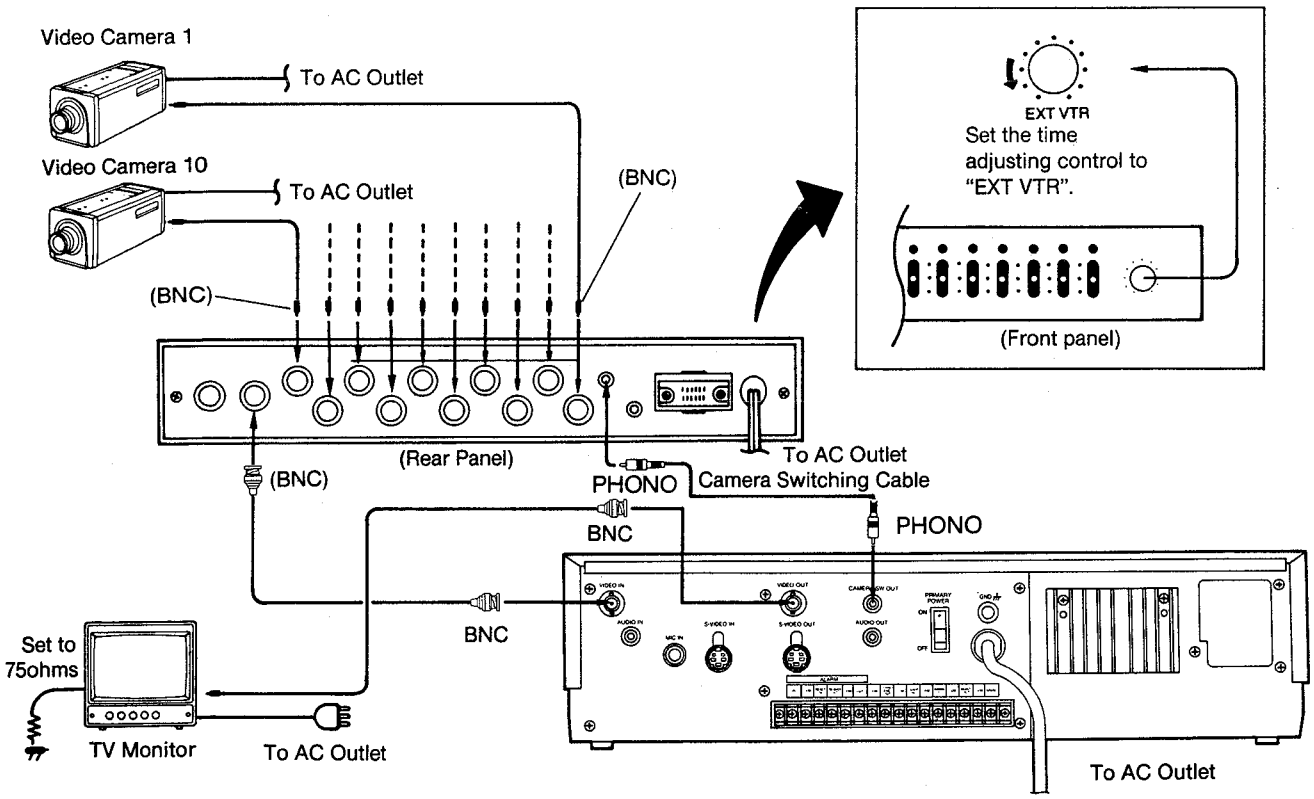
When recording with multiple cameras, the timing for automatic selection of the sequential switcher can be controlled by this unit, and multiple cameras can be correctly operated.

—Principle of Camera Switching



- In 72-hour mode, the camera is automatically switched over in the position of vertical sync signal every video tracks.
- The camera switching interval varies depending on the time mode. (Refer to page 21.)

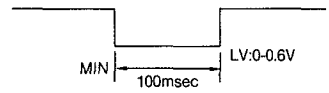
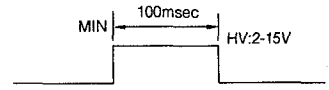
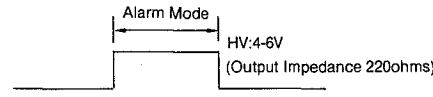
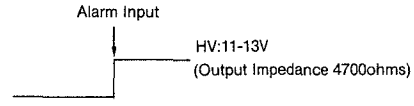
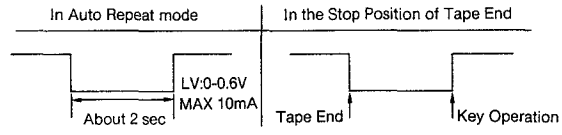
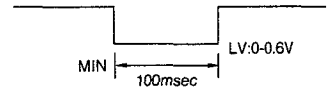
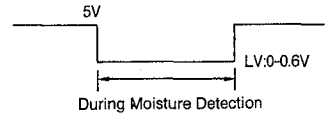
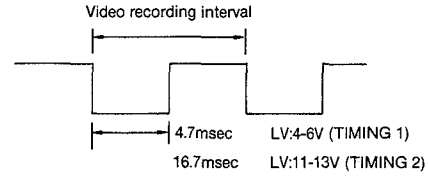
—Connecting for Sequential Switcher (option)



Note

- If EXT TIMING is not provided for sequential switcher or camera switching is not used, set the time to a point longer than the video recording interval (see page 21) of recording time mode.

Input/Output Terminal Signal Level

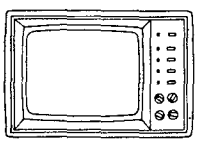
Terminal	Signal Level	Note
Alarm Input		LOW Input
Alarm Reset Input		HIGH Input
Alarm Recover Output		HIGH Output
Alarm Output		HIGH Output
Tape End Output		LOW Output
1-Shot Input		LOW Input
Warning Output		LOW Output
Moisture Sensor Output		LOW Output
Camera Switching Output		3-hour mode output is not possible Pulse Output

Playback

Before operation, press the Recording Mode Selector Button to clear "EXT TIMER", "INT TIMER" and "SENSOR" from the display.

1 Turn on the power supply to this unit and the TV monitor.

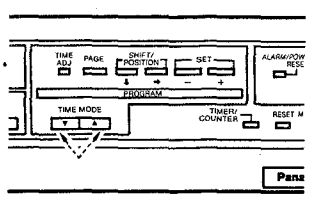
2 When the Mini-CCTV System is used, turn the Time Adjustment Control to the "VTR Play" position.

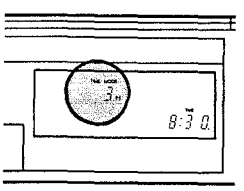


VTR Play

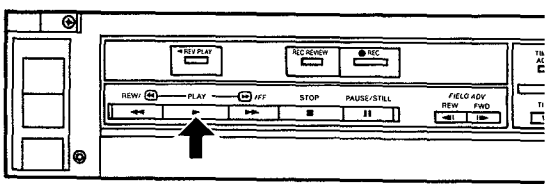
3 Insert a recorded cassette tape into this unit.

4 Select the time mode.





5 Press the Play Button.



Notes:

- Noise may appear on the screen when field advancing and reversing to the same location is done repeatedly when conducting a picture search on the tape.
  When noise has appeared on the screen, press the Field Advance Button to continue field advancing. This will eliminate the noise.
- During playback with the external timer setting mode, if the AC cord is disconnected and again connected or if normal power is restored after a power failure, this unit will automatically shift from playback to recording mode.
- When the Pause/Still Button is pressed during playback, this unit is set to still mode and a still picture appears on the TV screen. To clear it, press the Pause/Still Button again or the Play Button. If the Still mode continues for over 5 minutes, the unit will be placed in the Stop Mode.
- In the case of 1-shot playback, the tape will be automatically set to field advance in order to protect the video head if the Play Button is not pressed in the time set for "(1 SHOT) INTERVAL" on the Menu 3.
- When a tape recorded in time lapse mode (14~480 hours) is played back in the same mode, the picture slightly oscillates but this is not a malfunction.
- If horizontal AFC on the monitor is too long, a skew distortion may appear on the upper part of the playback picture, but this is not a malfunction.

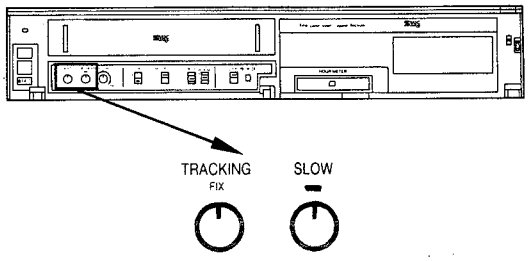
Better Playback

Carefully read the following description for better playback on this unit.

—Tracking Control

Noise appears in the picture or the date and time cannot be read due to noise during search playback.

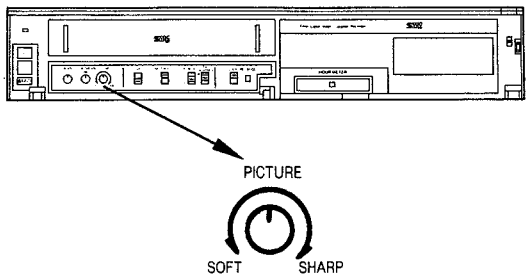
In the case of 14~480-hour mode, clear by turning "Slow Tracking" Control.
In the case of SP mode, clear by turning the "Tracking" Control.



—Playback Picture Sharpness Adjustment

To make the Playback picture softer or sharper.

Adjust the picture quality by the Picture Control.



Picture is made softer.

Picture is made sharper.

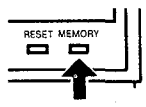
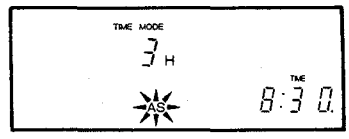
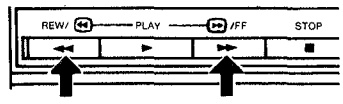
Playback in Various Ways

This unit is designed so that the contents of a recorded tape can be quickly reviewed according to the required use, such as monitoring and checking. Carefully read the description and become familiar with the operation. The operations mentioned below are to be performed during playback.

Selection	Operation	Function
To clearly play back a tape recorded in the time lapse mode.	Press the Time Mode Buttons used for the recording (14~480 hours).	Tape can be played back in Clear Slow mode without deflection or noise of the picture.
To clearly reverse playback a tape recorded in the time lapse mode.	Press the REV PLAY Button. Then press the Time Mode Buttons and select the mode for recording (14~480 hours).	Tape can be played back in reverse in Clear Slow mode without deflection or noise in the picture.
To quickly check the contents of a tape recorded in the time lapse mode.	Select the SP mode for fast playback and press the Fast Forward Button	Tape can be played back at a high speed. NV-E180 tape can be completely played back in about 36 minutes in fast forward mode.
To playback a tape in reverse which was recorded in the time lapse mode.	Select the SP mode and press the Reverse Playback Button or the Rewind Button (with unit in playback).	Tape can be played back in reverse, at a high speed.
To analyze a certain scene during playback.	Press the Pause/Still Button followed by the Field Advance Reverse or Field Advance Forward Button.	The tape can be played back in the Field Advance Reverse or Forward mode.
To view a still picture of a certain scene.	Press the Pause/Still Button.	Field still pictures can be obtained without deflection or noise.
Search for recorded alarm portion. (The Recording Mode Indicator is flashing.)	Use the alarm search playback or alarm memory function. (Refer to page 51.)	

• Alarm Search Playback

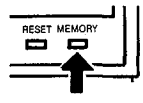
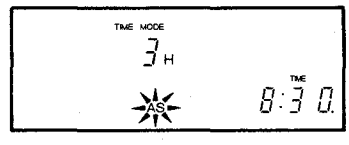
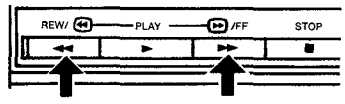
This function enables parts of the tape where alarms have been recorded in the 3-hour mode to be searched automatically.

Step	Selection and Operation
1	Light up the "AS" alarm search indicator on the display pressing the Memory Button.  
2	Press the Fast Forward or Rewind Button in the stop mode. When the tape is fast forwarded or rewound from the stop mode and a part with an alarm recorded is detected, the unit will first be placed in the stop mode and then returned to the playback mode, the tape will advance in the reverse direction, the part with the alarm recording will be located automatically and the still-picture mode will be set. 

Note

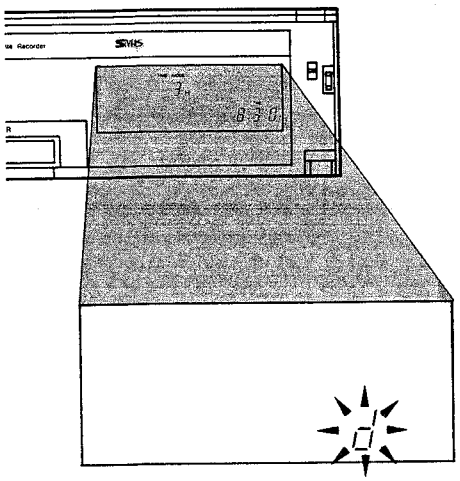
If there are any unrecorded sections on the tape, these may be mistaken for a part where an alarm has been recorded, in which case the tape will be stopped in the wrong place, but this is not a malfunction.

• Continuous search forward/rewind playback

Step	Selection and Operation
1	Light up the "AS" alarm search indicator on the display using the Memory Button.  
2	Press the Fast Forward or Rewind Button in the playback mode. Search forward or rewind playback will continue even if the Fast forward or Rewind Button is released. This type of playback can be released by pressing the Play Button. 

Moist Indicator

In case of dew detection (excessive moisture in the unit) the safety device of this unit will operate in order to protect the cassette tape and video head.



In case of moisture detection:

The "d" mark at display section flashes.

↓

Ejection will remain incomplete when a video cassette has been inserted.

↓

Wait until the "d" mark goes out with VTR switch turned "ON". It may take a few hours, although it depends upon conditions.

- Even when the sensor for detecting condensation is released, the above condition will be maintained for approximately 40 minutes.
- Moisture accumulation is similar to the phenomenon that occurs when water gathers on a window glass of a heated room during the winter season.
- Moisture accumulation is likely to occur.
  - in rooms soon after heating.
  - in humid rooms with high moisture content.
  - in humid conditions due to rain.

Daily Maintenance

This unit is designed for long-time service. It is recommended however, that you carry out a daily maintenance procedure. This will assure continued proper operation.

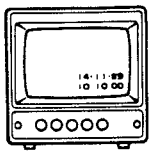
Note:
When auto repeat recording is desired, take care to carry out the daily maintenance.

• Procedure

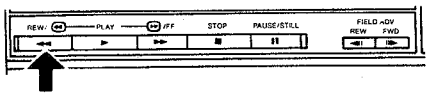
(1) Turn ON the VTR Switch of the unit, and equipment such as video camera and TV monitor which are connected to the monitoring system.

(2) Make sure that a proper picture can be seen on the TV monitor.

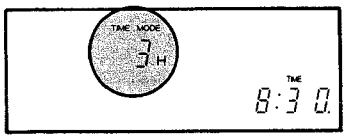
(3) Check the date and time displayed on the TV monitor.



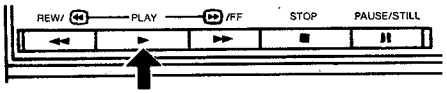
(4) Rewind the cassette tape recorded on the previous day by a few counts.



(5) Press the Time Mode Buttons to set the "3H" (SP) mode.



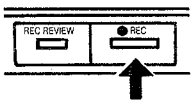
(6) Press the Play Button.



(7) Check the picture played back.

(8) Check for abnormality of the date and time of recording.

(9) Press the Record Button.



(10) Check the picture played back in "3H" (SP) mode.

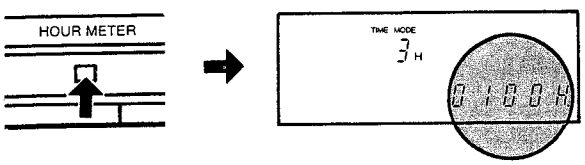
(11) After having checked all, select the mode which is to be set.

• Measure to be taken after checking

If abnormality should be found, turn OFF the VTR switch and disconnect the power cord plug from the outlet, then contact your authorized service personnel.

Periodical Maintenance

The hour meter informs you of the time the unit has been operating.
Check the duration of use by pressing the Hour Meter Button.



This helps you decide when to clean the unit or replace parts in order to ensure the best performance.
For details, consult your authorized service personnel.

Troubleshooting

Check the following points once again.

Installation

Power is not supplied.	•Check that power cord plug is properly connected to an AC outlet.
E-E pictures do not appear.	•Check the connection of this unit to TV monitor and video camera. •Check for defective contact of cord.
E-E pictures are not clear.	•Correctly adjust the focus of video camera.

Function/Operation

No operation with button pressed.	•Is the video cassette inserted correctly? Press the Eject Button to take out the video cassette and insert it correctly. •Is the Recording Mode Selector Button pressed until "INT TIMER" or "SENSOR" appears on the display? •Check for flashing of "⏍" Mark. (See page 52.)
"⏍" Mark is flashing.	•The unit does not operate because a safety device is actuated. Wait until the lamp goes out. (See page 52.)
Date and time display data are not memorised in case of power failure.	•Check if main power supply to connected equipment is off. •Check if the power cord plug of this unit is disconnected from the outlet for a long period of time. Connect the power cord plug of this unit to an AC outlet to charge it for at least 15 consecutive hours.

Recording

Playback, fast forward and rewind are possible, but recording is not possible.	•Check that the video cassette safety tab is not broken.
Recording is discontinued.	•Check if the video cassette tape is at the end. •Check if more than 5 minutes has passed after pressing the Pause/Still Button during recording. •Carry out the daily maintenance sufficiently. There must be something wrong if this kind of trouble takes place often. In that case, contact your authorized service personnel.
Power failure is over, but automatic continuation of recording is not resumed.	•Has a long-term power failure (lasting more than a month) occurred? To ensure that the unit is placed in the recording mode even with a prolonged power failure, press the Recording Mode Selector Button and set the external timer mode.
Not possible to stop recording.	•Check if the Recording Mode Lock Switch is "OFF".
Sound recording cannot be possible.	•Check if the recording time mode is set to 14- to 480-hour time lapse modes or the 1-shot mode. In these modes audio can not be recorded. Set to the 3-hour recording time mode.
Timer recording for 1-week programme is not correct.	•Check that the day of the week was correctly set when setting the date and time. (See page 34.)

Recording

Some cameras do not work in use of multiple cameras.	•Set the time to a point longer than the video recording interval of the recording time mode by turning the adjust of the sequential switcher. •Connect the camera switching cable between unit and the sequential switcher. (See page 46.)
Auto repeat recording is not possible.	•Check if the Stop Button was pressed during auto rewind mode.
Buzzer sounding for tape end is not possible.	•Check that the mode for buzzer sounding is set on Menu 5.
Timer recording is not possible.	•Check the timer recording Start and End time and the present time. •Check that the INT TIMER or EXT TIMER indicator on the display lights up. Press the Recording Mode Selector Button until the desired display appears.
Alarm/Sensor recording is not possible.	•Check that the alarm sensor is correctly connected to Alarm Input Terminal.
After alarm recording, automatic charge-over of multiple cameras is not possible.	•Check that the Alarm Reset Output Terminal is correctly connected to the Alarm Reset Input Terminal of "Mini-CCTV-System".

Playback

Pictures played back include noise sometimes, and they are not sharp and clear.	•Adjust by the Tracking Control. (See page 49.) Clogging and deterioration of the video heads are the possible causes. Contact your authorized service personnel.
Pictures played back flicker looking like snowfall.	•Check for dirt on the video head. Contact your authorized service personnel.
In case of multiple cameras, two scenes are played back during camera change-over.	•Check that the Camera Switching Cable is connected correctly.
When the power supply of the recorder is turned ON, recording begins and playback operation is not possible.	•Check if the EXT TIMER indicator lights up in the display. If it is, press the Recording Mode Selector Button to select another recording mode.
Connecting and disconnecting the power cord plug of this unit causes recording to start up, and playback not to start.	•Is the EXT TIMER indicator lighted in the display? If it is, press the Recording Mode Selector Button to select another mode?

Refer servicing to authorized service personnel.

Possible recording time in 1-shot recording

EX) When using the tape NV-E180 **(UNIT: HOURS)**

		Number of Field Recorded (field)											
		1	**2**	**3**	**4**	**5**	**10**	**15**	**20**	**30**	**40**	**50**	**60**
Video record intervals (min)	**1**	9000	4575	3100	2362	1920	1035	740	592	445	371	326	297
	2	18000	9075	6100	4612	3720	1935	1340	1042	745	596	506	447
	3	27000	13575	9100	6862	5520	2835	1940	1492	1045	821	686	597

Specifications

Power Source:	220-240 V AC, 50-60 Hz
Power Consumption:	Approx. 38 W

Video Recording

System:	2 rotary heads, helical scanning
Tape speed:	SP; 23.39 mm/s
Tape Format:	Tape width 12.7 mm (1/2 inch), S-VHS tape, VHS tape
Recording Time Modes:	3/14/24/48/72/120/180/240/480 hours and 1-shot mode
FF/REW Time:	Approx. 4 min. (with NV-E180)

VIDEO

Television System:	CCIR Standard (625 lines, 50 fields) PAL COLOUR signal
Modulation System:	Luminance; Frequency modulation recording Colour signal; Converted subcarrier phase shift recording
Input:	S-Video (4 pins); Y; 1.0Vp-p, 75ohms, unbalanced C; 0.3Vp-p, 75ohms, unbalanced Video Input (BNC); 1.0Vp-p, 75ohms, unbalanced
Output:	S-Video (4 pins); Y; 1.0Vp-p, 75ohms, unbalanced C; 0.3Vp-p, 75ohms, unbalanced Video output (BNC); 1.0Vp-p, 75ohms, unbalanced
Horizontal Resolution:	VHS: Colour; 240 lines B/W; 300 lines S-VHS: 400 lines (Colour, B/W)
Signal-to-Noise Ratio:	VHS: Colour; 43 dB B/W; 44 dB (Rohde & Schwarz noise meter)

AUDIO

Input:	Audio Input (Phono); −10 dBv, 47kohms, unbalanced Mic (M6); −60 dBv, 600 ohms~4.7kohms, unbalanced
Output:	Audio Output (Phono); −8 dBv, 600ohms, unbalanced
Tracks:	1 track
Signal-to-Noise Ratio:	43dB (3-hour mode)
Frequency Response:	50 Hz~10,000 Hz (3-hour mode)

CONNECTORS

Alarm Input:	Contact closure for alarm
Alarm Reset Input:	+3~+15V
Alarm Recover Output:	+5V, 220ohms
Alarm Output:	+12V, 4.7kohms
Tape End Output:	+12V, 4.7kohms
1-Shot Signal Input:	Contact closure for alarm
Warning Signal Output:	+12V, 4.7kohms
Dew Sensor Output:	+5V, 10kohms
Camera Switching Signal Output:	TIMING1; 5V/0V Pulse Width; 4.7msec TIMING2; 12V/0V Pulse Width; 16.7msec
Operating Temperature:	5° C~40° C
Operating Humidity:	35%~80%
Weight:	8.8 kg
Dimensions:	430(W) × 112(H) × 421(D) mm

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.